ELECTRICAL SOUTH

Serving the 18 Southern and Southwestern States

National Adequate Wiring Conference discusses time payment plans—pg. 24

APRIL, 1955

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Volume 35 **Number 4**

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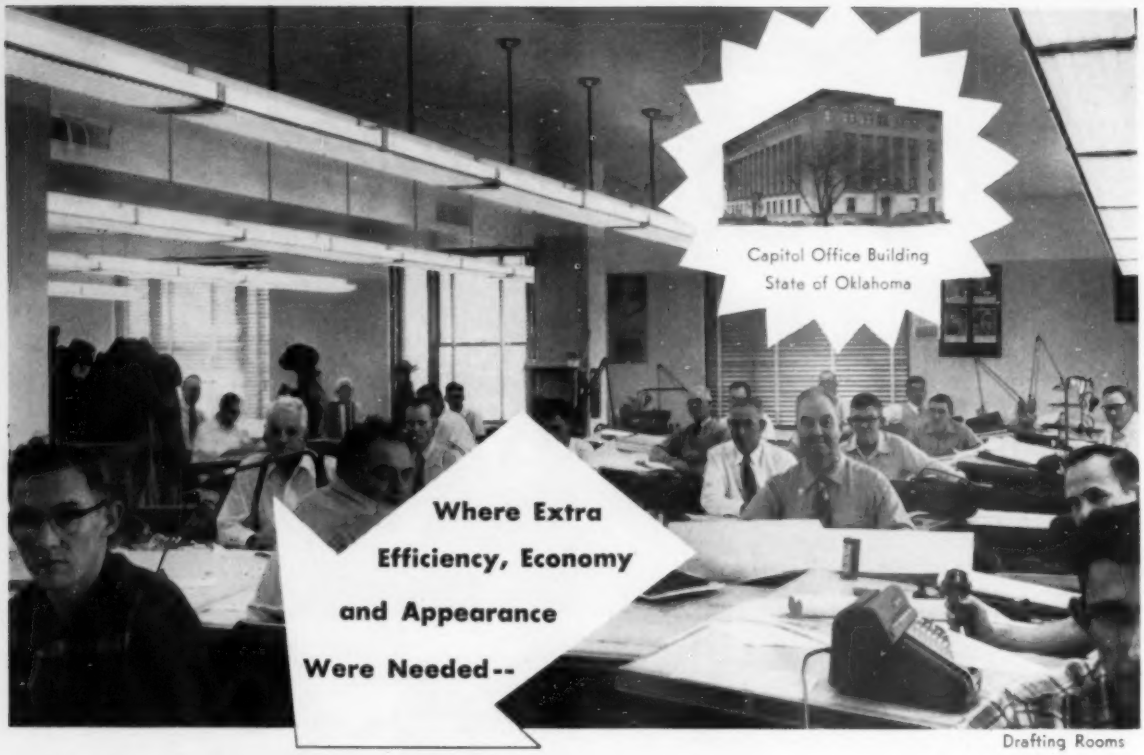

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In This Issue

Electrical construction with stud welding	18
More mileage for masonry drills	20
Electricity boosts glass production	22
10,000-homes with 100-ampere services	23
Time payment wiring plans	24
Highlights of Adequate Wiring Conference	28
Credit plan boosts adequate wiring	29
Residential section with ample street lighting	30
Know the law	31
Distribution substations in system planning	34
Techniques and equipment for future loads	38
Notes on new utility equipment	44
Electrical South data sheets	46

Economic comment	5
Association directory	8
Industry news	52
Dates ahead	70
News about people	72
Bulletins and booklets	78
New product news	82

Electrical construction at Memphis General Depot was simplified by stud welding, the method selected as most economical from the standpoint of time, skill, and materials by the contractor employed to install the six-warehouse wiring job of immense proportions. Details of the installations and why this method was selected are discussed in the article beginning on **page 19.**

The high cost of carbide-tipped drills makes an article on how to get **more mileage from masonry drills** particularly helpful information for anyone who uses such equipment. See **page 20.**

Officials of Knox Glass Bottle Co., in Jackson, Miss., have found that **electricity boosts production** from their existing gas-fired furnace and produces a much higher quality product than before it was installed. See **page 22** for their story.

Highlights of the National Adequate Wiring Conference held recently are quoted on **page 28,** and details of several **time payment wiring plans** discussed at the Conference will be found on **page 24.**

A **10,000-home community with 100-ampere services** is the result of an idea being developed by a Miami, Fla., contractor. The contractor feels that advantages gained for ultimate owners of the homes far outweigh the additional $40 required for each service. See **page 23.**

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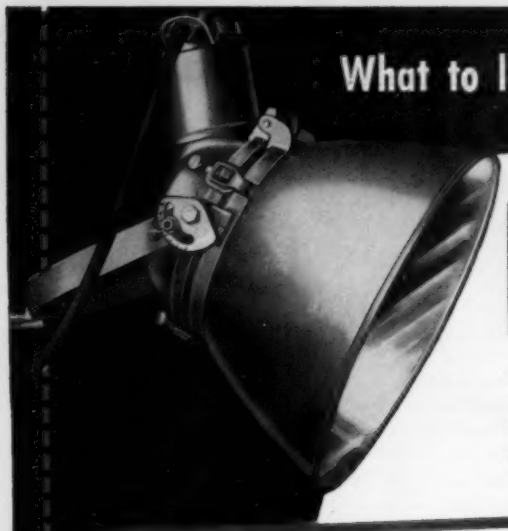

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FEATURES	CROUSE-HINDS TYPE FLA	Mfr. A	Mfr. B	Mfr. C	Mfr. D	Mfr. E	Mfr. F
1. Does it have a backdoor for easier lamp replacement and cleaning?	Yes	Yes	No	Yes	Yes	Yes	No
2. Is there a sight on the axis for more accurate aiming?	Yes	No	No	Yes	No	Yes	No
3. Are the door catches adequate for permanent weather-tightness?	Yes	Yes	Yes	No	Yes	Yes	No
4. Is the floodlight wired, eliminating additional costs?	Yes	Yes	Yes	No	Yes	Yes	No
5. Is the socket shell plated to prevent corrosion and lamps "freezing" in?	Yes	Yes	Yes	Yes	No	No	Yes
6. What is the socket temperature? (UL maximum safe operating temperature 200°C)	185°C	230°C	226°C	227°C	269°C	211°C	259°C
7. What is the cable temperature? (to minimize insulation deterioration)	135°C	181°C	202°C	150°C	231°C	173°C	195°C
8. Is the lens heat-tempered to prevent breakage?	Yes	Yes	Yes	Yes	Yes	Yes	No
9. Will the Floodlight withstand the UL rain test?	Yes	Yes	Yes	Yes	No	No	No
10. Are the gaskets adequate for permanent weather-tightness?	Yes	Yes	No	Yes	Yes	No	No
11. Is the floodlight rigidly constructed for longer life and accurate aiming?	Yes	Yes	Yes	No	Yes	Yes	No
12. Can you rotate the wire entrance to simplify wiring?	Yes	No	No	No	No	No	No
13. How many beam spreads are available and what are their efficiencies? — 14°	45.3%	N.M.†	N.M.	N.M.	N.M.	N.M.	N.M.
— 20°	44.9%	43.5%	43.8%	41.2%	N.P.‡	N.P.	N.M.
— 35°	48.6%	50.3%	49.1%	50.5%	45.2%	N.P.	38.6%
— 50°	50.2%	N.M.	N.M.	N.P.	N.M.	N.P.	N.M.
— 80°	57.8%	56.3%	58.4%	N.P.	N.P.	N.P.	60.3%

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Economic comment

by J. Whitney Bunting, Ph.D.

Investigations

◆ CURRENT ENTHUSIASM for all types of governmental investigations has finally spread into the area of economic life. The fact that the Senate Crime Commission and the Senate Sub-committee on Un-American Activity had such a widespread public interest when played before the popular eye of radio, television and the press, has carried all types of investigations into the same realm of notoriety.

Much good can be produced by a sound governmental investigation of public ills and problems. The record is full of such cases where the public welfare has been served both effectively and efficiently by such study groups. However, those leaders who stimulate such studies should be fully cognizant of the importance of these investigations and the results that can be accomplished.

There is the added consequence of psychological impact that can attend a public investigation of certain economic activity where the full story cannot be told because of time limitations and the lack of public understanding of high level economic operations. The latter was the case in the recent stock market investigation by the Senate Banking Committee. In fact there was a considerable difference of opinion between majority and minority membership as to the general wisdom of the hearings.

No words here are intended to convey any real disapproval of a system of public hearings. The public should be acquainted with *full* discussions of critical problems. However incomplete factual data coupled with a lack of informational background can cause intense worry and concern in relation to economic problems.

The erratic trends of stock market prices during the Senate investigations were indicative, in part, of the concern that people in all walks of life felt about conditions on the stock exchange. That these fluctuations were not more severe shows a clear indication of the strength of the present economy.

The results of this investigation were fairly consistent with the previous reports of most qualified observers. The market is high but prices are certainly not far out of line with the values behind the shares. In other words the security prices reflect the great strides forward in the net worth of most of our major industries.

In the past eight years the growth of plant values and in surplus holdings has been phenomenal for most companies. Taking advantage of prosperous conditions, modern management has repaired, maintained, and replaced both plant and equipment so that today's shareholders have a far greater equity than in years gone by.

Moreover, there is no way to truly determine the increased values that have come from such abstract advances as quality of business leadership. Industry has acquired much new managerial ability during these same years that should go far in maintaining the equity for the investor.

Unemployment

A surprising trend so far into 1955 has been the relative stability of employment. Usually, during the winter period, an increase of at least temporary unemployment is felt. This, frequently, is in that type of industry that requires style or fashion re-tooling for the next year's production. There is also a rather considerable increase in unemployment in the construction industry due to the seasonal nature of such operation.

However, figures developed so far in regard to first quarter unemployment show only a slight increase in persons laid off from work since the close of 1954. This is a strong indication of the strength of the economy and the confidence of business and industry in the present prosperous conditions. The confidence of industrial management and leadership can be measured most effectively by the status of industrial payrolls.

Approximately 93.7 per cent of those persons who are in the labor market are employed at this time. Many of those remaining are only listed as temporarily unemployed because their regular jobs will open up with seasonal improvement. Further, those who are employed have higher per capita wages than even during 1954. Since the level of taxes still appears to be relatively steady it is fairly safe to assume that expendable funds in the hands of the consuming public is apt to remain at a high level for some months to come.

Thus, in spite of very heavy production of such items as consumer durables including appliances, there is little fear of overproduction in these lines. It is interesting to note that the market for such items shows little tendency to dry up, in spite of periodic fluctuations in sales volume. Rather the stability of consumer durables is a further evidence of national economic strength.

One other barometer of interest is the number of regularly employed persons in the construction industry. In spite of the poor weather conditions (this winter has been exceptionally bad for housing and building construction) new construction continues to roll into higher figures, both quantitatively and in terms of dollar value. This in spite of some fears that the domestic housing market soon may be overstocked with available homes for sale.

Early spring reports from realtors show fine prospects for this year and, if conditions continue, more Americans will own new homes than in any period of our national history. This, in itself, tends to promote confidence and stability in economic life. But it

(Continued on page 89)

Dr. Bunting, well-known southern economist, is president of Oglethrope University, Oglethrope Univ., Ga.

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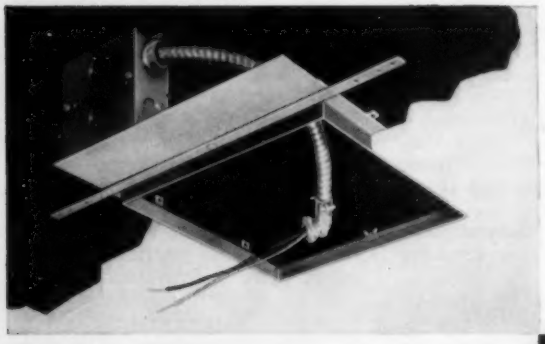
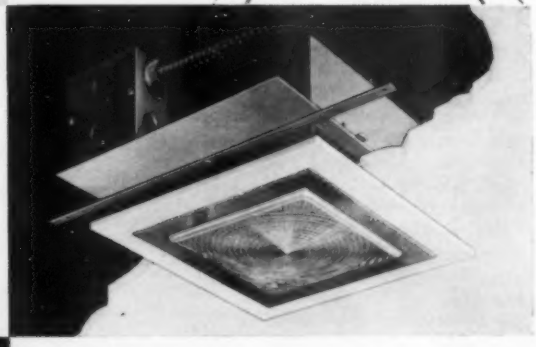


The Binary Plaster Frame of Art Metal units has complete installation equipment including attached junction box, wire, Greenfield and two mounting rails.



Complete specifications on Art Metal pre-wired plaster frame and lens boxes are found in Bulletin 254. We suggest you write for this bulletin . . . it'll show you how to save installation time and money on your next job!

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IAEI, Missouri-Kansas Chapter. T. McGinnis, Secretary-Treasurer, City Hall, Topeka, Kan.

IAEI, St. Louis Chapter. Neil W. Butteiger, Secretary-Treasurer, 7427 Canton Ave., University City 14, Mo.

IAEI, North Carolina Chapter. C. S. Whitaker, Secretary-Treasurer, City Hall, Durham, N. C.

IAEI, Oklahoma Chapter. T. C. Wier, 1907 W. 41st St., Tulsa, Okla.

IAEI, South Carolina Chapter. N. R. Darling, Secretary-Treasurer, P. O. Box 390, Columbia, S. C.

IAEI, Tennessee Chapter. R. E. Ward, Div. of Fire Prevention, 102 State Office Bldg., Nashville 3, Tenn.

IAEI, Texas Chapter. R. L. Payne, Secretary-Treasurer, 3303 Schley St., Dallas, Tex.

IAEI, Texas Gulf Coast Chapter. M. W. McRaven, Secretary-Treasurer, P. O. Box 1700, Houston 1, Tex.

IAEI, Southern Section. A. M. Miller, Secretary, 910 West 30th St., Richmond 25, Va.

IAEI, Virginia Chapter. A. M. Miller, Secretary-Treasurer, 910 West 30th St., Richmond 25, Va.

IAEI, West Virginia Chapter. H. L. Parks, Secretary-Treasurer, P. O. Box 626, Charleston, W. Va.

MOTOR REPAIR SHOPS

National Industrial Service Association, Inc. Fred B. Wipperman, Executive Secretary, 818 Olive St., St. Louis 1, Mo.

NISA, Southeastern Chapter. M. E. Assalone, Secretary, 235 NW 2nd Ave., Miami 36, Fla.

NISA, Electric Motor Service Association of the District of Columbia. John W. Lainhart, Secretary, 913 E. St., NW, Washington 4, D. C.

NISA, Louisville Chapter. W. C. Krauth, Secretary, 118 S. 1st St., Louisville, Ky.

NISA, New Orleans Chapter. William Dreis, Secretary, 1517 Calliope St., New Orleans, La.

NISA, Mid-South Chapter. Murphy G. Miller, Secretary, 109 Jennings Ave., Knoxville 17, Tenn.

NISA, Southwestern Chapter. George Foshee, Secretary, 203 S. Main, Fort Worth 4, Tex.

NISA, Electric Club of West Virginia. O. E. Jenkins, Secretary, c/o Guyan Machine Co., Logan, W. Va.

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CATALOGS and BULLETINS

Available Free to Readers of Electrical South upon Request

1048—Plug-In Strip

An illustrated catalog showing the complete "Plug-in" Strip line has recently been published by National Electric Products Corp., Pittsburgh, Pa. This eight-page illustrated brochure pictures the three and six foot standard lengths of the multi-outlet branch circuit assembly.

1058—Conductor Fittings

A complete catalog, illustrated and listing prices, has been issued by Penn-Union Electric Corp., Erie, Pa. Described is the company's complete line, including a wide variety of service connectors, terminals, tees, and taps; also many other types of conductor fittings.

1076—Modular Lighting

A 20-page booklet containing interesting and useful information about the "modular system" of lighting can be obtained by writing to the Mitchell Manufacturing Co., 2525 Clybourn Ave., Chicago 14, Ill.

1082—Lighting Equipment

Preprints of the F. W. Wakefield Brass Co.'s eight-page section on lighting which will appear in the 1954 Sweet's Catalog are available on request to Wakefield, Vermilion, Ohio. Included are descriptions of 11 major types of lighting equipment.

1086—Cable Connectors

Tomic Sales and Engineering Co., 4864 Woodward Ave., Detroit 1, Mich., now have available catalog sheets containing data on the complete line of their connectors, couplings, and cable connectors.

1088—Fittings and Fixtures

A 32-page illustrated catalog covering Killark fittings and fixtures is offered by Killark Electric Mfg. Co., Vandeventer and Easton Aves., St. Louis 13, Mo.

1090—Midget-Size Busduct

Complete information on Power Plugin, the new, midget-size busduct, is found in bulletin No. 720, available from Frank Adam Electric Co., 3650 Windsor Pl., St. Louis 13, Mo.

1092—Electrical Boxes

Steel City Electric Co., 1207 Columbus Ave., Pittsburgh 12, Pa., offers a catalog of their complete line.

1130—Conduit Fittings

The latest completely illustrative catalog on their diversified line of conduit fittings is announced by the Atlantic Conduit Fittings Co., 589 Atlantic Ave., Boston 10, Mass.

1136—Space Heating Guide

Cavalier Corp., Chattanooga 2, Tenn., has prepared a Guide for Calculations of Electric Space Heating. It is based on study of several thousand installations of electric heat and is a handy reference for calculating electric heating requirements and estimating operating costs. The booklet contains discussion, charts, and floor plan examples.

1150—Fluorescent Fixtures

Colorful, 20-page catalog. Front cover shows interesting illustration of "Light through the Ages." Catalog gives complete specifications and pictures of entire Naturlite line manufactured by Light & Power Utilities Corp., 1035 Firestone Blvd., Memphis, Tenn.

1156—Industrial Lighting

The new Abolite Catalog and Handbook contains a complete descriptive story of all commercial, industrial floodlighting equipment manufactured by Jones Metal Products, Inc., West Lafayette, Ohio.

1166—Electrical Fittings

A 40-page illustrated catalog and price list on the Gedney line. Shown and listed are conduit, threaded entrance, SEC, EMT and ground fittings, and box connectors for both armored and non-metallic cable. Copies are available from Gedney Electric Co., RKO Bldg., Radio City, New York 20, N. Y.

1172—Busduct Manual

A 68-page manual, Bulletin No. B-4272A, describing types of busduct and accessories available, and presenting application and test data, specifications, and information on pricing a typical busduct installation is available from Westinghouse Electric Corp., Box 2099, Pittsburgh, Pa.

1178—Remote-Control Wiring

Bulletin 16-200 is a 36-page manual describing layout and installation of remote-control wiring, and is available from General Electric Co., Construction Materials Dept., Bridgeport 2, Conn. Advantages and explanation of the system are followed by illustrated installation procedure.

ELECTRICAL SOUTH
806 Peachtree St., NE
Atlanta 5, Ga.

April, 1955

Gentlemen:

Please send me the bulletins and catalogs indicated.

(Print Plainly)

Name ..... Title .....

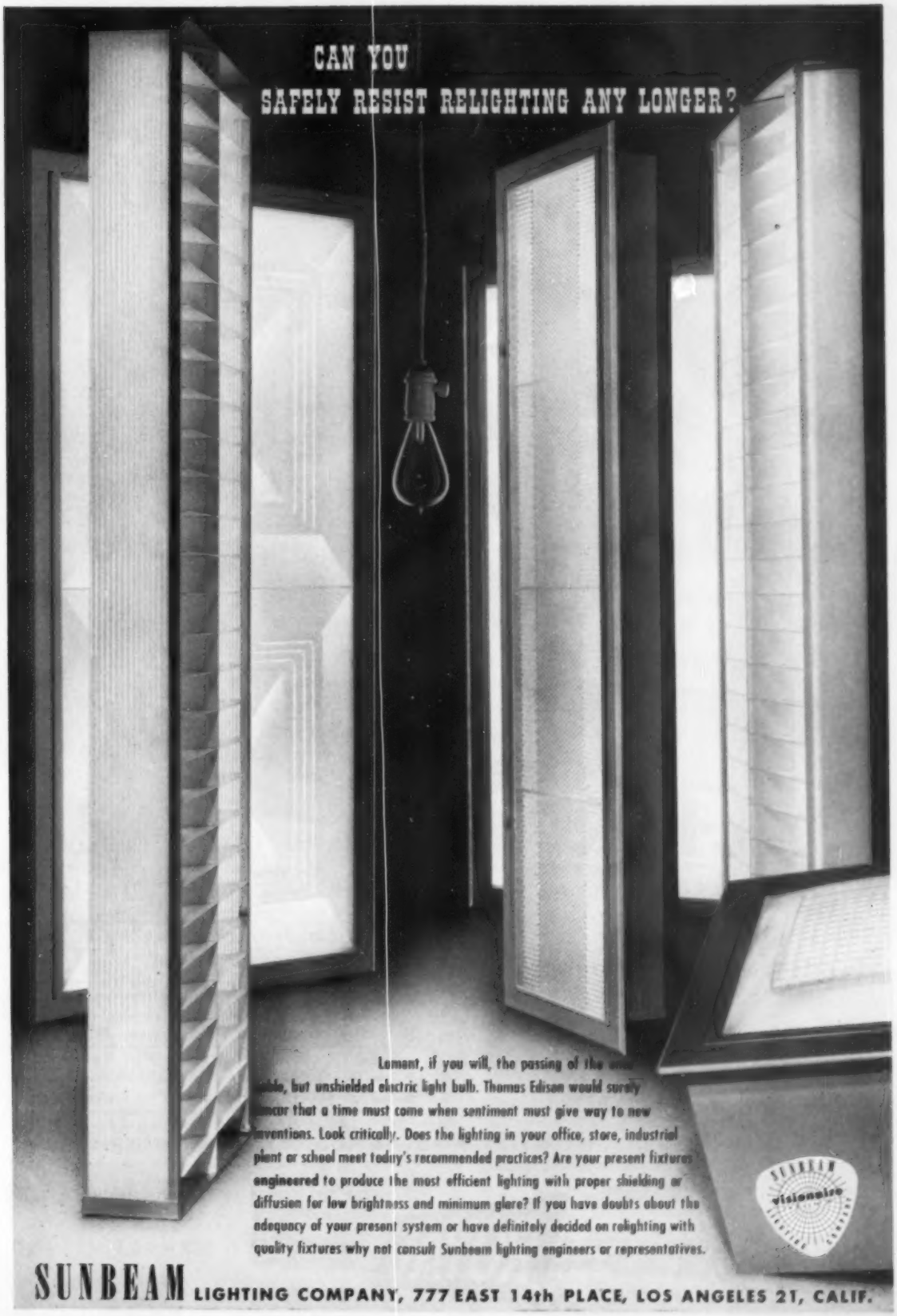
Company .....

Address .....

City & State .....

Circle numbers below. Bulletins and catalogs will be mailed promptly.

1048	1058	1076	1082	1086
1088	1090	1092	1130	1136
1150	1156	1166	1172	1178
1184	1186	1188	1190	1192
1200	1202	1204	1208	1214
1218	1220	1224	1228	1230
1232	1234	1236	1238	1240
1242	1244	1248		


CAN YOU
SAFELY RESIST RELIGHTING ANY LONGER?
Lament, if you will, the passing of the
able, but unshielded electric light bulb. Thomas Edison would surely
ncur that a time must come when sentiment must give way to new
nventions. Look critically. Does the lighting in your office, store, industrial
plant or school meet today's recommended practices? Are your present fixtures
engineered to produce the most efficient lighting with proper shielding or
diffusion for low brightness and minimum glare? If you have doubts about the
adequacy of your present system or have definitely decided on relighting with
quality fixtures why not consult Sunbeam lighting engineers or representatives.
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SUNBEAM LIGHTING COMPANY, 777 EAST 14th PLACE, LOS ANGELES 21, CALIF.

the famous ROYAL ELECTRIC "POWR-KORD"

HEAVY-DUTY RUBBER EXTENSIONS

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NOW AVAILABLE IN

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. . . the color protects the cord, makes it stand out against all backgrounds

packed in individual corrugated cartons

"POWR-KORD"

IS FULLY UL LISTED

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M-1625	25'	16-2 SJ	1	24	50
M-1650	50'	16-2 SJ	1	12	44
M-16100	100'	16-2 SJ	1	6	44

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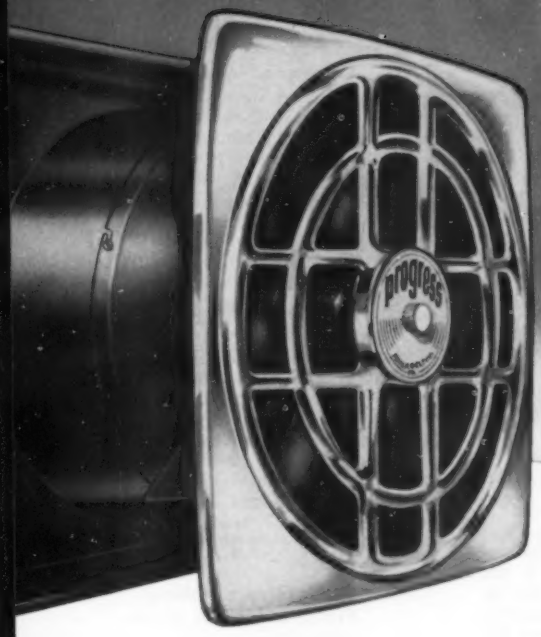
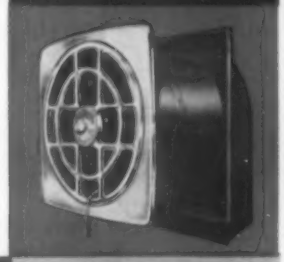
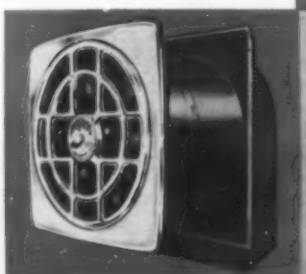
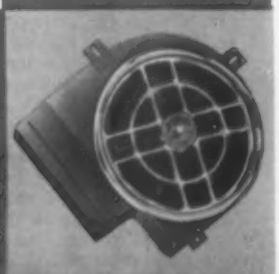
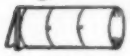








Just look at these "plus" features:



- Exclusive Progress "all-size sleeve" permits easy installation regardless of wall thickness up to 14" (And only ⅓ as much inventory to stock).
- Progress "Power-Vent" removes more air in less time.
- Striking grill design with exclusive Progress "super-chrome" or baked white enamel finish.
- Heavy gauge steel construction with exclusive Progress rust-proof outdoor finish.
- Entire grill assembly easily removed with turn of knurled thumbscrew for easy cleaning.
- Heavy-duty, kitten-quiet motor fully guaranteed for 5 years.

Progress POWER-VENT Fans are fully tested for plus performance both in the laboratory and on the job.

Whether your customer is planning to build . . . to rebuild . . . or to replace, there's a Progress POWER-VENT fan that's best for his job — and you can sell him with the same confidence that America has placed in Progress lighting fixtures for nearly half a century.

progress

WRITE FOR BULLETIN FB-55

PROGRESS MANUFACTURING CO. INC.

1184—Approved RHW Wire

Bulletin No. 1018 describing first Underwriters' Approved Type RHW Wire, developed to meet the new National Electrical Code standards, is available from Simplex Wire and Cable Co., 79 Sidney St., Cambridge 39, Mass.

1186—Electric Heating File

This file offered by Electromode Corp., 45 Crouch St., Rochester 3, N. Y., is made up to suit individual requests for information on Electromode Heaters for domestic, industrial or farm use; or to contain material on the complete Electromode line if desired.

1188—Dry-Type Transformer

An eight-page illustrated booklet on the Type E, totally-enclosed, nonventilated dry-type transformer is available from Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa. Made in ratings from three to 50 kva, the transformer provides greater economy for plant distribution systems where dirt, lint, and non-explosive dust are a problem.

1190—Electrical Fittings

Blackhawk Industries, Dubuque, Iowa, offer a new two-color bulletin describing and illustrating B-I Electrical Fittings and Fixtures. Included are conduit and cable fittings, conduit and cable straps, staples, box supports, sill plates, locknuts and bushings, wire holders and yard lights.

1192—Wire Pulling Lubricant

Illustrated six-page folder showing the advantages of an improved Y-Er Eas wire pulling lubricant is available from Electro Compound Co., 3812 150th St., Cleveland 11, Ohio.

1200—Fluorescent Fixtures

Complete information on commercial fluorescent and incandescent lighting of all types, for offices, schools, libraries, etc., and all industrial locations available from Benjamin Electric Manufacturing Co., Leader Div., Northwest Highway, Des Plaines, Ill.

1202—Code Explanation

Bulletin 2660 contains up-to-date information (following 1953 Code revision) on why equipment for hazardous locations is designed and built as it is, and is available from Crouse-Hinds Co., Wolf & 7th, No., Syracuse 1, N. Y.

1204—Conduit Fittings

Illustrated Catalog available upon request to Electrical Fittings Corp., Woodside, N. Y., or their nearest warehouse in your locality contains complete information on the company's electrical conduit fittings, conduit nipples, couplings, and elbows.

1208—Contemporary Lighting

Two brochures describing contemporary lighting fixtures for residential, commercial and display purposes. Included are sizes, types, framing-in details, illustrations. Prescolite Mfg. Corp., 2229 Fourth St., Berkeley 10, Calif.

1214—General Catalog

General catalog of Royal Electric Co., Inc., Pawtucket, R. I., covering flexible service and lamp cords, cord sets, extensions, trouble lights, wiring devices and decorative Christmas lighting is available to wholesalers. Dealer catalogs may be secured from Royal distributors.

1218—Carbon Products

A 28-page catalog on Motor and Generator Brushes and carbon products telling how to order brushes, grade recommendations, characteristics and description of brush grades is available from the Helwig Co., 2536 North 30th St., Milwaukee, Wis.

1220—Stadium Lighting

The Pyle-National Co., 1334 N. Kostner Ave., Chicago, Ill., announces the availability of a new eight-page bulletin, No. 605, on stadium lighting, describing in detail floodlighting of a typical outdoor athletic arena stressing the importance of using fully enclosed floodlights.

1224—Electrical Equipment

The Wadsworth Electric Mfg. Co., Inc., Covington, Ky., has issued a new catalog Con 15-0 and Bulletin W. C. B. 53-1, containing data on their lines of Safety Switches, Service Equipment, Distribution Panels and "E-Z-RED" Circuit Breakers.

1228—Time Controls

A revised and enlarged edition of the booklet "How Time Controls Save Work, Time and Money on the Farm" has been announced by the Paragon Electric Co., Two Rivers, Wis. The revised edition includes new time control applications devoted to showing farmers how to earn more money by actually doing less work.

1230—Hot Line Repairs

Twenty time-saving techniques for making hot line repairs and replacements are detailed in a new 72-page, spiral-bound, pocket-size book for on-the-job use. Included are useful charts giving the characteristics of all bare conductors. Copies are available from James R. Kearney Corp., Dept. HF, 4236 Clayton Ave., St. Louis 10, Mo.

1232—Electrical Controls For The Textile Industry

Fully described in 8-page circular by The Arrow-Hart & Hegeman Electric Co., Hartford 6, Conn. Includes: shock-resistant, lint-proof Loom Switch and also Starters, Contactors and Combination Starters in lint-proof NEMA XII enclosures.

1234—Radiant Glass Electric Heating Panels

A pamphlet may be obtained from the Berko Electric Mfg. Corp., Queens Village 28, New York. This colorful piece fully describes the features of Berko electric heating panels, providing special drawings, photographs and specifications.

1236—Lighting Fixtures

Novelty Lighting Corp., 2481 East 22nd St., Cleveland 15, Ohio, is now offering two new catalogs of their church and other lighting fixtures line. Catalog No. 62 illustrates lighting for interiors and exteriors of churches of any denomination. Catalog No. 63 and Folder No. 183 describe exterior bronze lanterns for public buildings and residential use, and the complete line of Novelty recessed fixtures and directional exits signs for church, school, commercial and residential use. All three publications are available upon request.

1238—Selecting Fuses

A 12-page descriptive handbook "Fuseology" tells how to get safest, most dependable, trouble-free electrical protection from fuses. Contains useful information on selecting right size and type of fuses — how to stop needless blows — avoiding poor contact and other troubles. Issued by Bussmann Mfg. Co., University at Jefferson, St. Louis 7, Mo.

1240—Catalog of Fixtures

Catalog No. 9 of Prescolite Manufacturing Corp., 2229 Fourth St., Berkeley 10, Calif., available upon request, contains attractively drawn illustrations of fixtures and scale drawings of their dimensions, as well as descriptive information and suggested applications for each fixture in the Prescolite line. List prices of the fixtures in Catalog No. 9 is inserted as a separate sheet with each of the booklets.

1242—Distinctive Lighting Fixtures for the Home

Jay Lighting Manufacturing Company, Inc., 25 Quincy Street, Brooklyn 38, New York has available upon request a new six-page illustrated supplement featuring their fixtures for the home.

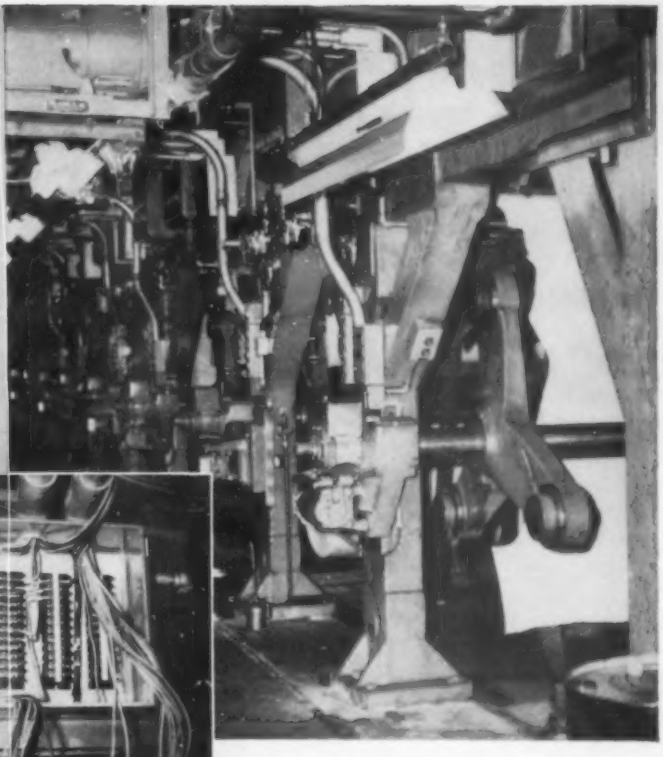
1244—New Electrical Fittings Catalog

Concise 36-page catalog illustrates and describes a complete line of electrical fittings, cable racks and wiring specialties. The catalog contains many detail drawings, clear-cut photographic illustrations of mast fittings, cable connectors, straps, hangers and ground clamps in a wide variety of types and sizes. For your free copy, write The M. & W. Electric Mfg. Co., East Palestine, Ohio.

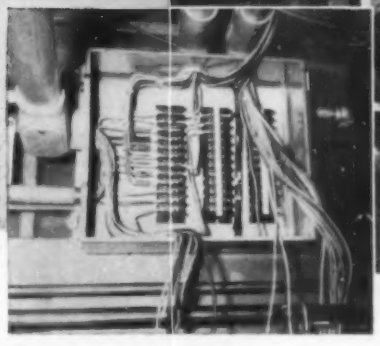
1248—Conductor Armor

A new catalog of Superformed Armor Rods, Lineguards, Patch Rods, and Tap Armor describing various uses and applications of these products on overhead conductors is offered by The Fanner Manufacturing Company, Brookside Park, Cleveland 9, Ohio.

Part of the "reel room" at a metropolitan newspaper. These units paste rolls of newsprint together semi-automatically at full press speed. Uninterrupted flow of paper lets three presses print 52,500 32-page newspapers per hour.



Terminal panel interior showing partially connected wires for pasting circuit. It's easy to identify Simplex-ANHYDROPRENE markings.



Photos courtesy of Detroit Free Press

This Metropolitan Newspaper Keeps Presses Rolling with *Simplex-ANHYDROPRENE* Wire

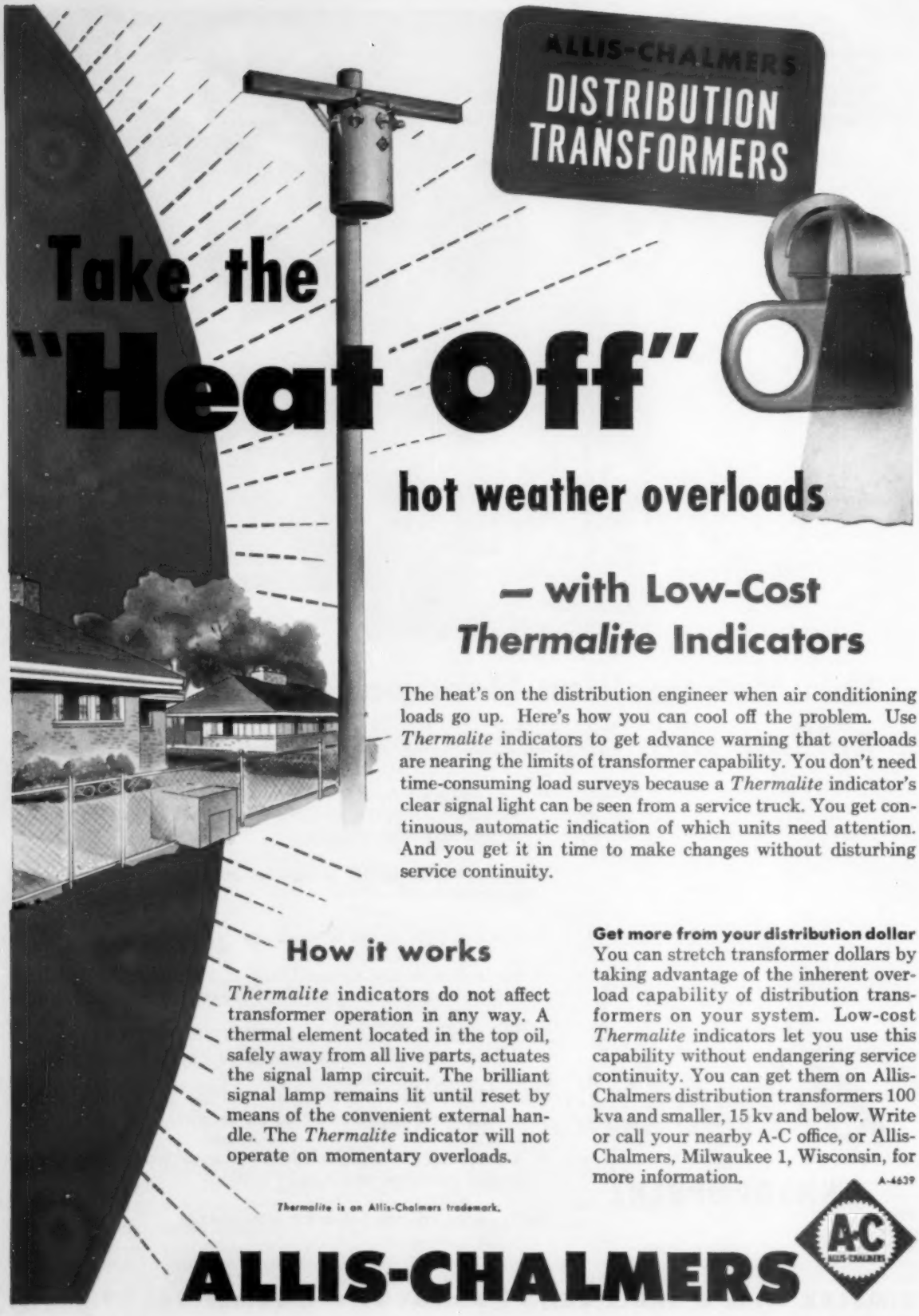
- A metropolitan newspaper has installed 250,000 feet of Simplex-ANHYDROPRENE Wires and Cables to connect motors and control stations.
- ANHYDROPRENE is easy to train and trunk in control panels.
- The neoprene jacket is tough and long enduring.
- It's a Simplex compound that is unequaled for balanced resistance to sunlight, oil, acids, excessive heat and flame.
- The Anhydrex insulation of ANHYDROPRENE Wires and Cables makes them resist water as no other insulation does.
- ANHYDROPRENE is suitable for use in conduits, underground ducts and exposed wiring indoors.
- It's especially recommended for wiring control circuits, underground primaries and factory systems.
- Write the address below for more details.

Simplex

ANHYDROPRENE

SIMPLEX WIRE & CABLE CO., 79 Sidney Street, Cambridge 39, Mass.

NEW SMITHCRAFT TROFFERS FEATURE



Take the "Heat Off"

hot weather overloads

— with Low-Cost *Thermalite* Indicators

The heat's on the distribution engineer when air conditioning loads go up. Here's how you can cool off the problem. Use *Thermalite* indicators to get advance warning that overloads are nearing the limits of transformer capability. You don't need time-consuming load surveys because a *Thermalite* indicator's clear signal light can be seen from a service truck. You get continuous, automatic indication of which units need attention. And you get it in time to make changes without disturbing service continuity.

How it works

Thermalite indicators do not affect transformer operation in any way. A thermal element located in the top oil, safely away from all live parts, actuates the signal lamp circuit. The brilliant signal lamp remains lit until reset by means of the convenient external handle. The *Thermalite* indicator will not operate on momentary overloads.

Get more from your distribution dollar

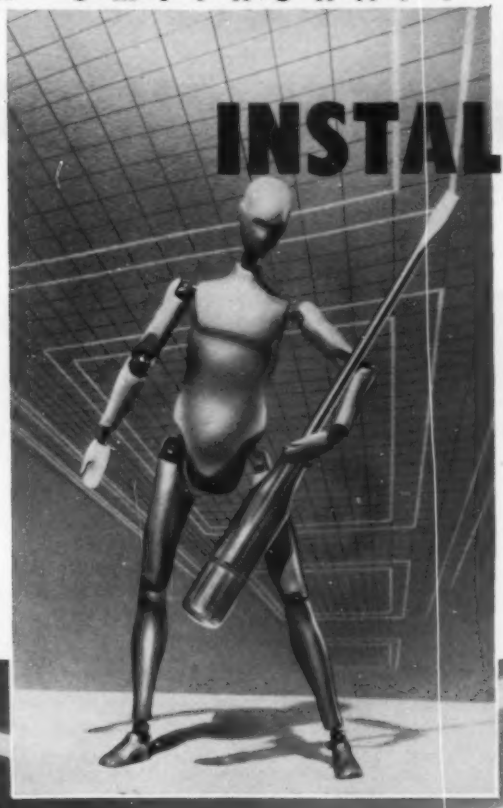
You can stretch transformer dollars by taking advantage of the inherent overload capability of distribution transformers on your system. Low-cost *Thermalite* indicators let you use this capability without endangering service continuity. You can get them on Allis-Chalmers distribution transformers 100 kva and smaller, 15 kv and below. Write or call your nearby A-C office, or Allis-Chalmers, Milwaukee 1, Wisconsin, for more information.

A-4639

Thermalite is an Allis-Chalmers trademark.

ALLIS-CHALMERS

NEW SMITHCRAFT TROFFERS FEATURE ROCK-BOTTOM INSTALLATION COSTS!



Only tool need is a screwdriver for final adjustment. No exact positioning required. Minimum number of parts and assembly on the job. Maximum simple adjustability at every critical point. Adaptable to most ceilings with a single, easy-to-install clip; provision for simple adaptability to all other ceilings. These new features save hours and dollars for you. And the Smithcraft Troffer installations you make mean more business for you. The new Smithcraft Troffer presents a clean, trim, uncluttered appearance because for the first time in the troffer lighting there are no visible catches, latches, bolts or screws. Perfectly straight, trim, in-line rows free from light leaks or blemishes. Here at last is a troffer that meets the contractor's every troffer need.

This mounting bracket with simple clip attachments adapts the Smithcraft Troffer to a great majority of the ceilings in use today.

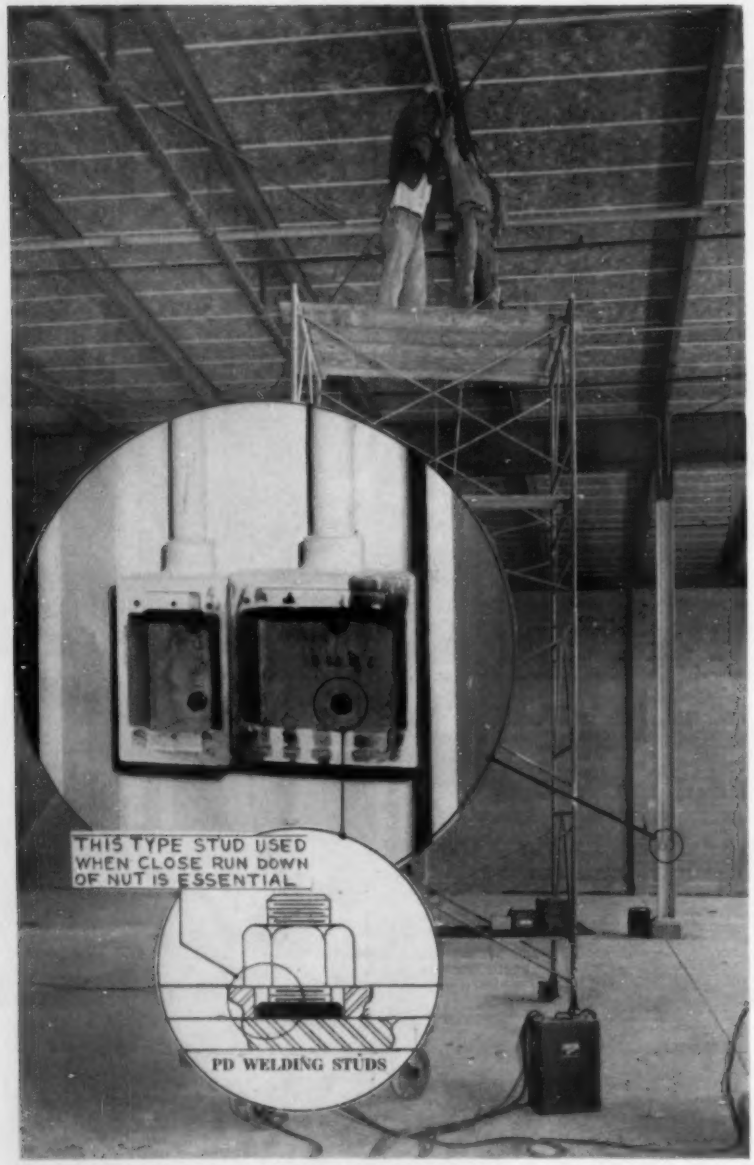
The new Smithcraft troffer-in-plaster frame method assures perfectly square plastered openings and is unbelievably simple to install.

Write today for the new Smithcraft Troffer Book illustrating and describing the new Smithcraft Troffers in detail.

Door frame containing glass, plastic or lens instantly opens or closes by simple pressure upwards.
In louvered units, louvers hinge from either side and are removed without tools or loose parts.
Smithcraft
LIGHTING DIVISION
CHELSEA 50, MASSACHUSETTS

Electrical construction at Memphis

by Richard Swayer
Field Engineer, Stud Welding Division
K S M Products, Inc.



Shelby Electric men prepare to weld KSM type "PD" studs to "I" beam. Man on left holding a locating measure stick, while other holds stud gun to beam. When gun trigger is depressed, arc will be initiated and after a time period (possibly 1/3 second), predetermined by cycle setting in control box (lower center), stud will be automatically plunged into molten pool. Cooling almost instantaneously, stud is then securely welded to metal. Inserts show closeup of switch box secured with studs.

◆ SIX NEW WAREHOUSES, each measuring 200 feet by 1,000 feet, recently completed at the U. S. Army's Memphis (Tenn.) General Depot, called for a major fastening operation in hanging 140,000 feet of electric conduit, 4,020 outlet and switch boxes, and 3,726 lighting fixures from structural steel ceiling and wall members.

Experimentation

The great size of the job led the contractor, Shelby Electric Co., Memphis, Tenn., to experiment in order to find the fastening method most economical from the standpoints of time, skill, and materials. There were three available methods: steel supporting beams could be drilled or punched, and conduit hangers and outlet boxes then bolted through the holes; powder-actuated tools could drive bolts through the metal; or studs could be welded to the steel with stud-welding equipment, leaving threaded ends available for hanging conduit and boxes.

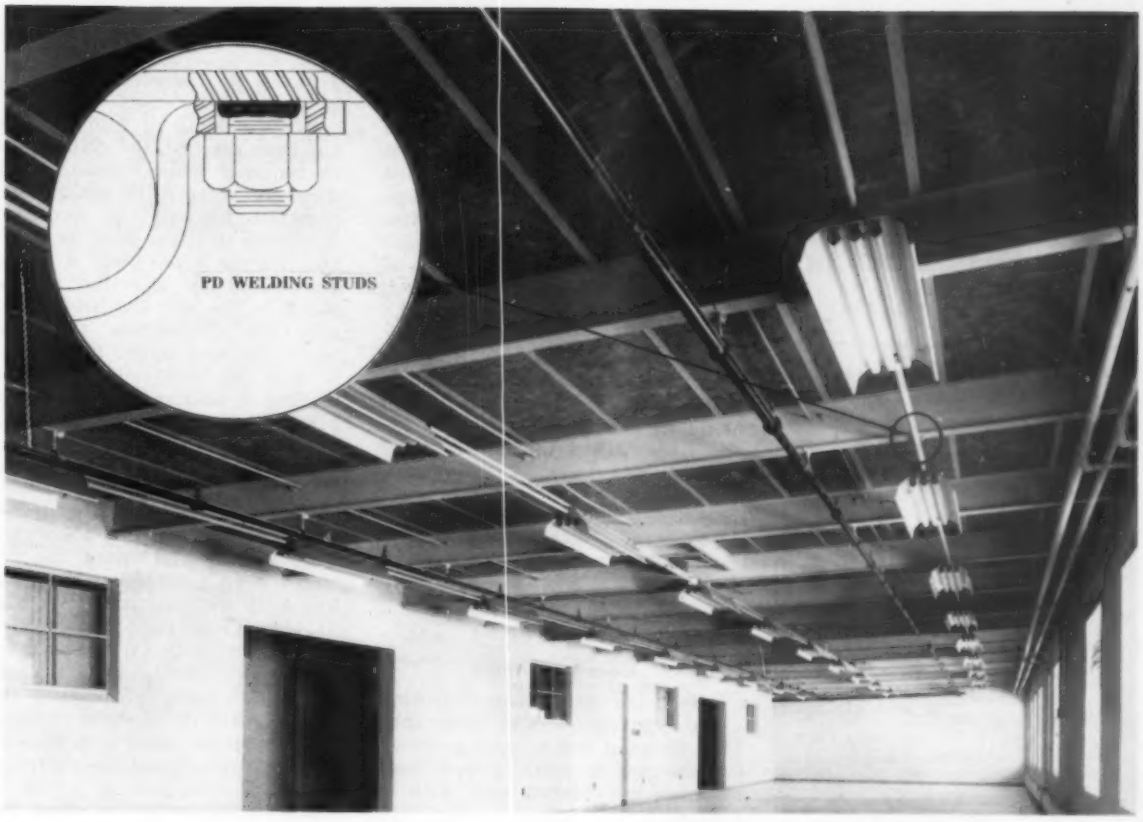
Since the latter two methods required a crew of only three men to lay out and set 400 studs a day, while drilling or punching required a crew of nine men for the same number of holes, the through-bolting method was eliminated.

Installation procedure

Further, the contractor found that stud-welding material costs in this case would be less than powder-actuated stud costs. Therefore, stud welding was the method chosen and used throughout the six warehouses. Almost 33,000 arc-welding studs were installed, using two stud-welding guns and control units with one K S M portable battery unit.

A brief explanation of the stud-welding principle will help clarify the installation. The stud welder places the threaded end of the stud

General Depot simplified by stud welding



Fluorescent lighting and conduit supported by studs welded to beams and columns. Insert shows pipe strap hanger secured to girder with stud.

in the chuck of an arc-welding gun. Setting the exposed precision-centered solid flux of the stud at the point of welding, he simply pulls the gun "trigger," and the stud is welded automatically. Duration of the welding arc is precisely regulated by the integral stud-welding control unit. On overhead construction work without a production jig, one man may weld studs at speeds up to six a minute.

Cost of studs

Total cost to Shelby Electric for studs complete with arc shields was $1,150.35, about $250 more than bolts of the same sizes. Despite the higher cost of studs, the two-third saving in man-hours enabled the contractor to realize an overall cash saving of $8,500 by the use of stud welding over alternate fastening methods. Time savings alone amounted to $110.40 for each of 77 working days on the six buildings.

Additional benefits of the stud-welding method became apparent as the construction proceeded. Since the men had to work from only one side of the structural members, and did not have to hold bolt heads with one hand while holding outlet boxes and running nuts with the other, the job of assembling the electrical equipment on hangers was considerably speeded.

Threefold value

The advantages of stud welding proved threefold in the Depot job: (1) A small crew of men was enough to lay out and install studs with minimum supervision; (2) a saving of $8,500 in construction time was realized from the speed of stud welding; and (3) the assembly of conduit and outlet boxes was simplified by welded studs being in precise position to receive the equipment.

More mileage from masonry drills

by L. H. Houck

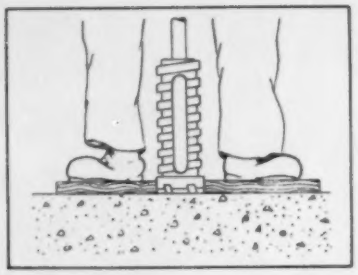


Figure 1. When impractical to chip a groove, drill a hole in one-inch thick board, place hole in desired position, stand on board until hole is well started. Then remove board.

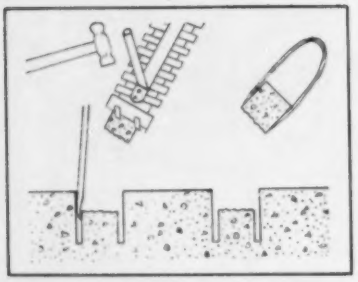


Figure 2. When drill has left a core in hole, it must be removed before drilling is resumed. Use a bar to break off core and loop of wire to remove it.

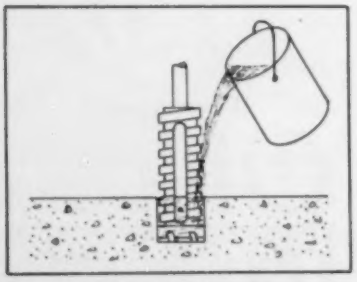


Figure 3. Water should be used in downward holes larger than 1½ inches in diameter and more than 6 inches deep. Pour water in slowly and keep hole full.

◆ WERE IT NOT FOR THE COST of carbide-tipped masonry drills, information on getting more mileage from them wouldn't be of much importance. However, a standard core, full slot, core drill with tungsten-carbide cutters in 2-inch size sells for $30, one make of ⅝-size costs $8.50. These drills can be ruined in a few hours by improper handling, and worse, they can be used inefficiently over a longer period thus causing an invisible high-dollar loss in wasted time.

The trouble with drilling a hole in any material is that it's an operation that everybody "knows how to do." Consequently the directions go into the trash can along with the empty box.

This review of rules for using carbide-tipped drills of all kinds can save you money, particularly if the information is reviewed with your entire force.

Core-type tools

Here are instructions for using core-type drills: This type drill has no point and to start properly in concrete a cavity ⅛-inch deep should be chipped out with a chisel.

If it is impractical to chip a groove, drill a hole in a 1-inch thick board about 3 feet long, the same size as the drill to be used. Place this hole or template in the position to drill the hole in the correct place and stand on the board while you drill to hold it in place while the drill is being started. After well started remove the board. (See Fig. 1)

Proper power and pressure must be applied for best results and long drill life. Power and pressure are the most important elements in rotary drilling of masonry and concrete. A drill should be used which has enough power when sufficient pressure is applied to drill at least 2 inches per minute for all sizes up to 1-inch in diameter. Drills 1 to 2-inches should drill 1 inch per minute and 2 to 4 inches in diameter at the rate of ½-inch per minute.

After a depth of 2 to 4 inches has been reached, the drill should be removed while rotating. With these core-type drills the cuttings come up through the core slot. When the drill has been removed and the slot is not clear it should be cleared by inserting a long punch in the slot and driving the core out. Sometimes the drill leaves the core in the hole where it must be removed before the drilling is resumed. Use a bar to break off the core and a wire with a loop to remove it. (See Fig. 2)

Drills and water

Water should be used in downward holes larger than 1½ inches in diameter and more than 6 inches deep. Pour water in slowly and keep the hole full. (See Fig. 3) *Always wear rubber boots when using water with an electric drill.*

If you strike steel while drilling concrete or masonry, such as reinforcing bars or concrete encased beams, you can easily drill through it. The drill should be sharp. A dull drill may jam or break. A sharp drill should be kept for drilling steel and interchanged with the masonry drill when steel is encountered.

When a drill is in the hole it should not be rotated unless pressure is applied except when being removed to clear cuttings. Idling in the bottom does more damage and dulls cutters more quickly than the actual work of cutting. The heat built-up can reach sufficient heights to loosen the cutters of carbide which are usually brazed to the steel of the drill.

Life span of points

Use any method that is convenient for applying the proper pressure. Some pressure ideas are shown in Figs. 4 to 7. Stay near the specifications given in this accompanying table to insure longer life for your drills.

Drill Size	Recommended Drill Motor	Recommended R.P.M.	Recommended Pressure
3/16" to 7/16"	1/4" to 1/2"	500 to 1200	50 to 200 lbs.
1/2" to 1"	1/2"	300 to 550	100 to 500 lbs.
1" to 1-7/8"	1/2" up	200 to 550	150 to 500 lbs.
2" to 4"	3/4" up	100 to 300	200 to 800 lbs.

These specifications, if followed, will insure longer drill life.

Rotary core drills should not be used after a 1/32nd flat shows on the cutters. To use it in this condition will cause excessive wear and breakage of the cutters due mostly to abnormal development of heat.

Carbide-tipped core-type drills can be sharpened free hand on any grinder equipped with the proper grinding wheel. Wheel should be silicon carbide in 80 to 100 grit, such as Norton wheel 39C100-H7V or 39C80-H7V or Carborundum wheels GC100-H8VW or Abrasive wheel numbers G100-H-Z-8 and G89-H-Z-8.

Grind only A and B edges as shown in Fig. 8. Top of cutter is ground 15 to 20 degrees and outside corner 20 to 25 degrees. Be sure not to grind the outside diameter or inside corner of cutters.

Besides the core-type drills there are half dozen makes of carbide-tipped drills with both tight and loose spirals. These drills require similar treatment, and sharpening rules are virtually the same.

Sharpening drills

Such drills need sharpening when a flat of 1/64th inch or more develops on the cutting edge and the 118-degree included angle should be restored in the sharpening.

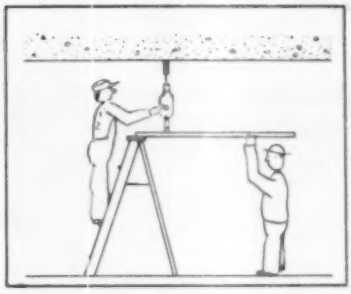
The exact steps are:

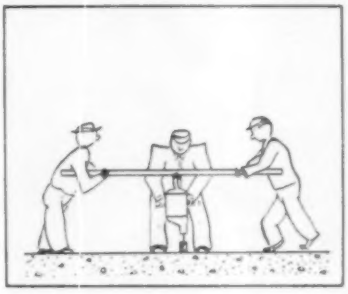
(1) Only the recommended silicon carbide wheels should be used, of course, and then you should bring the drill against the side of the grinding wheel at a 20-degree angle as shown in Fig. 9. If this 20-degree angle is not maintained the drill will not cut properly.

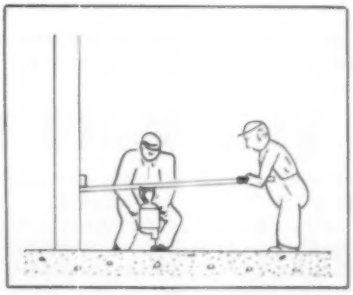
(2) Using moderate pressure, move the drill back and fourth across the wheel to avoid overheating. (Fig. 10) If drill does overheat do not cool in liquids but allow it to cool in the air.

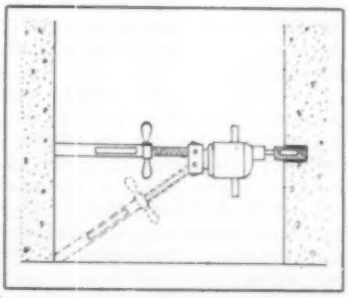
(3) Keep the two cutting edges

(*Continued on page 94*)









Figures 4-7. Illustrated are several convenient methods for applying proper pressure.

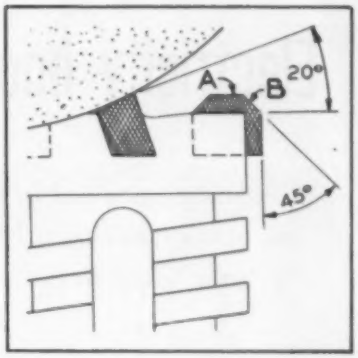
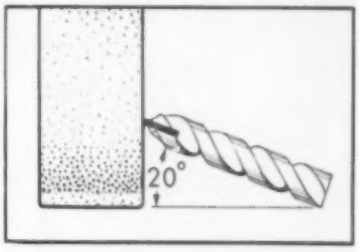
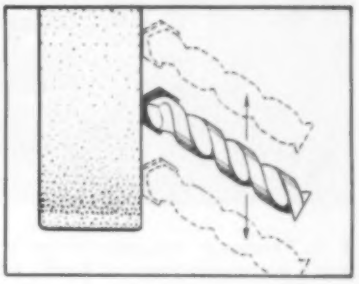
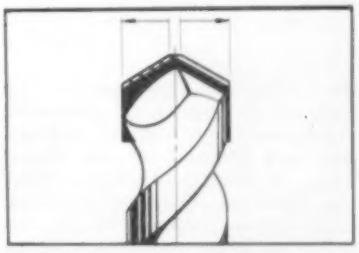
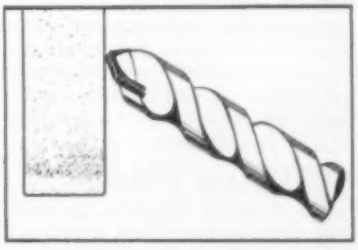


Figure 8. Angles at which cutting edges should be sharpened.







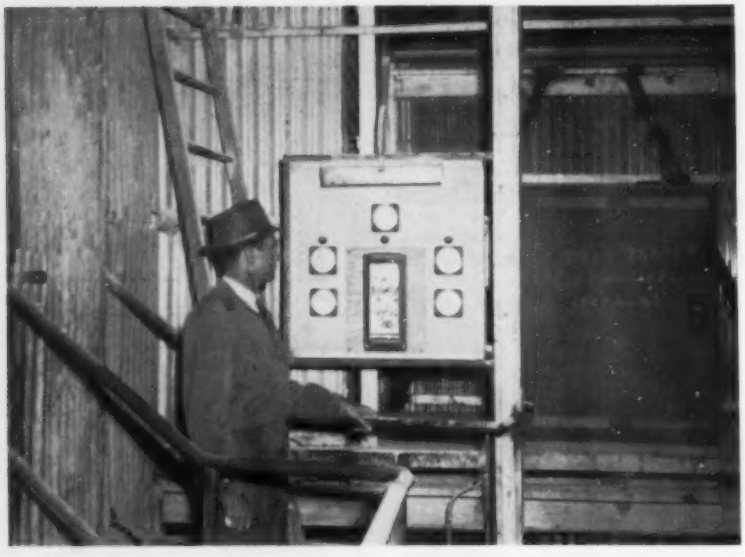


Figures 9-12. Steps in the proper way to sharpen carbide-tipped drills of various kinds.

Electricity boosts production

Electrodes installed to boost gas furnace heat are also producing a better quality of glass for Knox Glass Bottle Co., Jackson, Mississippi

H. L. Robinson, engineer at the Knox Jackson plant, points to one of four electrodes whch is helping his firm increase production of a better quality product.



E. G. Thomason, Mississippi Power and Light industrial sales representative, reads instrument panel at Knox's new electric heat installation in Jackson.

◆ ELECTRICITY has solved the problem of how to get increased glass production from an existing gas-fired furnace for the Knox Glass Bottle Co., Jackson, Miss., the Southern Division of Knox Glass Bottle Co., Knox, Pa.

The problem was important to company officials, who needed to increase the capacity of their Southern Division, but could not economically justify shutting down the present operation and investing a considerable sum of money in a larger furnace.

Increased production

The furnace, which is an integral part of the entire operation, was originally designed to produce 100 tons of glass a day, and in order to increase production it was necessary to increase the amount of heat. This they were not able to do with their gas furnace.

Now, Knox has increased production considerably and is getting a better grade of glass by the recent installation of four electrodes which currently put a little over 300 kw into the furnace daily, operating 24 hours a day at unit power factor.

The Jackson plant already had its own distribution system, and in order to serve the furnace installation, Mississippi Power & Light Company added a separate 500-kva transformer bank. The secondary service to the furnace is three-wire, three-phase, 120 volt, delta.

The electro-melt installation required the drilling of holes in the sides of the furnace. These holes were drilled low enough so that the inserted electrodes extend right into the molten glass mass. Running water prevents the melted material from running out around the electrode, the cool liquid solidifying the glass at the entrance of the electrode.

To increase or decrease the amount of electric current flowing into the furnace, the electrodes are pushed further into the tank or withdrawn.

The system consists of two electrodes in the front of the furnace and one on each of two sides. The electricity flows from electrode to electrode, through the glass, increasing the amount of heat, and thus boosting production.

The original gas heat installation, which was operating at its peak, is arranged in such a manner that the gas jets blow flame over the top of the molten composition of glass ingredients — sand, feldspar, old glass, etc., whereas the electric portion of the heat flows directly into, and through, the material.

Improved quality

H. L. Robinson, engineer for Knox's Jackson operation, says that it is easy to see why the addition of all this electricity has enabled them to increase the amount of heat and the total production of the bottle plant, but they have not been able to absolutely determine the reason for the better quality they are now getting, using the same composition of materials.

(*Continued on page* 94)

Preassembled meter boxes, risers, and weather heads for the Carol City home community being built northwest of Miami, Fla., by Gaines Construction Co. By using preassembled units like these terminal boxes, sub-contractor John Monahan, Monahan's Electric Co., Miami, can install electrical equipment in 20 homes per day. All homes are equipped with 100-ampere service, capable of handling all home appliance loads.

10,000-home community with 100-ampere services

◆ No popping fuses, fuzzy TV pictures or lukewarm air conditioning will occur at Carol City, near Miami, Fla., where the first of 10,000 homeowners have begun moving into the nation's first "electric city."

Thanks to 100-ampere electrical service, unprecedented for homes in the $7,025 to $8,650 price range, Carol City homeowners will be able to safely operate all of the 53 electrical appliances now on the market. House for house, there's more electric current available in Carol City than in any other community of this type in the country. To handle it, there will be over 2800 miles of copper wire, safely sheathed in steel conduit and plastic non-conductors.

Provisions for future

The first light switch in Carol City was flipped in January by an executive of the local power company in time for the first families to move into the initial section of the fully planned community. When completed, Carol City is expected to be Florida's ninth largest community with some 40,000 people.

Vice-President Richard B. Roberts, of Florida Power and Light Co., which will serve Carol City declared, "Carol City, built for all electric living, marks another important step in the development of an efficient, safer, more comfortable home. The 100-ampere service prevents waste of electric current, minimizes the danger of over-heated wires, and eliminates unsightly extension cords and homemade gadgets that can cause short circuits. We are proud to join with the developers of Carol City to provide home wiring that is not only adequate for today's appliances but for tomorrow's inventions as well."

According to the research department of the Florida Power and Light Co., the use of electricity in the home has doubled in the past

(*Continued on page 92*)

Time payment wiring plans

by J. P. Brown
Residential Sales Manager
Alabama Power Company

One of the principal features of the National Adequate Wiring Conference held in Chicago recently was a panel discussion on installment plan wiring modernization procedures and experiences. Several southern electrical industry executives participated in this discussion, describing plans in actual operation. Their comments are presented here.

◆ A FEW MONTHS ago, our company decided to offer such a plan whereby its customers could finance the cost of adequate wiring on a monthly installment basis. We discussed the plan with the Electrical Contractors Association, appliance distributors, and dealers and they were very enthusiastic over the idea. After the details had been worked out, a kick-off meeting announcing the plan was held in our company auditorium with all the wiring contractors, appliance distributors, dealers, and others in our organization concerned with such an undertaking present.

Our vice-president and general manager opened the meeting by explaining the need for the plan after which the use of the contract forms, financing charts, and other pertinent information pertaining to credit were explained. After this initial meeting, we conducted other meetings in headquarters towns of our six divisions with the same groups represented and again the idea was well received.

Loan amount limited

I know that you are interested in knowing just how the plan works:

1. The maximum amount financed in any one residence is $500 and the minimum amount is $30. Down payment is 10 per cent of the contract price with monthly installments not exceeding 24 months provided that no monthly payment is less than $5.00.

2. The plan is not applicable to residences under construction.

3. The plan is not applicable to rental residences unless the property owner signs the contract and assumes the responsibility for monthly payments.

4. The home owner selects a contractor of his choice to survey his home for the purpose of estimating the cost of the wiring to be done. If the owner and contractor agree on a fixed price, the contractor explains the terms and conditions of Alabama Power Company's financing plan and fills out a form furnished him by our company and secures a down payment not less than 10 per cent of the agreed total cost. He also secures from the customer the necessary credit information as shown on the back of the contract form and explains that the contract will be submitted to the proper authority at the nearest Alabama Power Company office for credit approval for financing the unpaid balance. When approval is given, the contractor and customer are notified and the contractor is then authorized to start the work. Under no condition does the work start before credit approval is given by our company. If credit is declined, the contractor notifies the customer and returns his down payment. When a contractor sells a rewiring job, he fills out the contracts and submits them to our nearest office for credit approval. Since only home owners are eligible under our plan, the credit problem is not a factor.

When work is completed, contractor secures a signed certificate of completion from the customer on a standard form furnished him by the company which states that the conditions of the contract have been met and our company is authorized to pay him the balance due.

Power company risk

5. There is no recourse on the electrical contractor and when he is paid, our company assumes full risk for the collection of the entire balance. Needless to say, this is a calculated risk we are taking but we believe that the overall risk is worthwhile. Wiring improvements are not included with electric bills. We use postcard billing and no charges other than for electricity used appear on the bill. Our billing office bills all other charges separately. Before launching our program, we investigated several financing plans, all of which entailed more details than we thought desirable. Our company sponsors a finance company owned by a local bank. This company is located in our main office in Birmingham. By altering the standard appliance contract to fit wiring contracts, we were able to adapt it to our needs.

We sell our paper to the finance company; interest is included on the unpaid balance. Neither the contractor nor finance company assumes any liability if the account goes delinquent. We buy the paper back and do the collecting.

Acceptance of work

6. For obvious reasons, we make no inspections from the standpoint of workmanship or cost. We believe that a customer spending this much money, in most cases, will get bids from two or more contractors which should enable him to get a reasonable cost figure on the work to be done.

7. In the metropolitan areas, only licensed electrical contractors are authorized to do such wiring;

however, in the rural areas frequently a customer may want to do his own work or his son home from college may have taken a course in wiring and would be capable of doing such work. In such cases, we will finance it.

8. Alabama Power Company acts solely as the financing agent and assumes no liability for any damage to owner's property which might result from the work done.

We are very enthusiastic over the plan and look upon it as a promotion of realistic financing whereby everyone concerned is mutually benefited.

Promotion plans

The Birmingham contractors are enthusiastic about our plan and many of them tie in with our advertising, both newspaper and radio.

Ours is a year-round promotional program and our contact employees are calling on all contractors at least once a month in the interest of the plan. We insist that leads be followed promptly and have learned which contractors we can depend on to follow through.

At first we had some trouble getting contracts correctly filled out. This is no longer a problem.

We are aggressively promoting this plan as a continuing part of our sales program and our entire sales personnel, along with other customer contact employees, are explaining the plan at every opportunity. For instance, our home service girls carry a little booklet, "What Happens When Wiring Is At Fault" into every home on all home service calls. Our dealer representatives are discussing it with the various appliance dealers and contractors in their respective territories. Our home service personnel also cover it in detail in school meetings and in all types of demonstrations.

Special employees

Very shortly in each of our six divisions, we will have an employee who will devote all of his time to the promotion of the heat pump as well as working with the electrical contractors and architects on adequate residential wiring.

Our plan did not get underway until October, 1954, which was well after the air conditioning season. We feel that results to date are satisfactory and feel that, with the resumption of our advertising on January 1, last, the program will accelerate greatly.

At the moment, we are not contemplating any changes in our plan. We feel it is adequate, simple, and attractive to the customer, the contractor and the company.

Through December 20, 233 jobs in the amount of $26,506.00 have been financed; this is an average of $113 per job. This is entirely residential. Commercial is not eligible under the plan. Reports show that cash jobs, which have resulted from our activity, have tripled the jobs financed.

By now you may be asking yourself this question, "What does this plan have that the FHA financing plan does not have?" We are not in competition with FHA and if the customer wishes to use that plan we recommend it very highly; however, we know there is less red tape with our proposition and that, in most areas, even with loans backed by FHA, quite a few banks are not interested in loans of less than $200 because of the low interest rate and the cost of the clerical work involved.

"Wire on Time" Program

by John S. McDermott

Executive Manager
Electric Assn. of Kansas City, Mo.

◆ IN CONSIDERING the "Wire on Time" program for Kansas City, we felt that one of the most attractive features of our plan would be the widespread appeal of allowing the customer to pay for the wiring improvements on his electric service bill. Based on experience of several other cities, with the average dollar volume of wiring jobs running approximately $238, we felt that an installment plan would have universal appeal—regardless of the income bracket of the customer.

Because the Kansas City program established certain minimum requirements, we knew that the majority of our jobs would run at least several hundred dollars. We reasoned that the success of our plan would be predicated on the ease with which the modernization jobs could be financed, because of the higher average dollar volume per job.

Utility reserves used

A preliminary check indicated that banking institutions were not too enthusiastic. Since we had close cooperation of Kansas City Power and Light Co., we considered another possibility in financing. Kansas City Power and Light merchandises, and has worked for some time with the First Bancredit Corporation in financing of appliances.

As a result, certain reserves had already been established, and it was a relatively simple matter to contact First Bancredit Corporation and secure their co-operation in financing the wiring program. By way of explanation, First Bancredit Corporation is the financing institution, established a number of years ago, by a group of Minnesota banks, with home offices in St. Paul.

Since the local utility had a most favorable working relationship with the company, it was only natural to set up details of the finance plan with them. First Bancredit Corporation works directly with the contractor. Contractors refer their prospects to First Bancredit, who in turn investigate the credit and then notifies the contractor of acceptance or refusal of the customer. If refused, the contractor then must work out his own plan of financing with that particular customer, if he cares to proceed.

When credit is approved, and it can be done the same day the request is made, the contractor then signs the necessary forms with the customer and proceeds to do the wiring. Upon completion of the wiring, the contractor notifies the utility and sends the contract to First Bancredit. The utility sends a man out to inspect the job, and the home owner is then given a certificate, indicating that the job has been completed. The utility inspector notifies First Bancredit of that fact, and the contractor is then paid for the job. All the information is then sent to the utility and billing begins on that customer's very next bill. This entire procedure takes two days and has been working satisfactorily so far.

Information provided

The Electric Association provides the contractor with all necessary forms, together with a complete chart of costs, and finance charges. The charts include prices, the amount of the note, and the amount of the monthly payment. The chart is comprehensive, and covers periods of 12, 24, 30, and 36 months. So the contractor has easy and ready reference in filling in the amounts to be financed and

what the monthly payment will be.

The carrying charge runs 7 per cent annually, and 10 per cent down payment is required. No contractor is subject to repurchase of uncollectible accounts.

One feature that seems to appeal to participants in this plan is the speed with which a customer's credit can be cleared, as well as the short time involved in issuing a final check to the contractor. The cutting of "red tape" by this method is a tremendous advantage. No recourse on the contractor is a good feature, too.

Although our area has had one large contractor actively engaged in promotion of the home wiring field, this particular contractor also has joined in our program, and still offers his own method of bank financing, as well as our plan.

Weaknesses isolated

Our plan has been in operation a comparatively short time. It actually got underway in October. Our advertising and promotion purposely stopped during December and early January, because of the holiday season. However, we have attempted to follow the program carefully in an effort to work out any weakness.

Frankly, the one apparent weakness to date has been at the contractor level. Leads that have been developed have not been followed promptly in many cases. In others, contractors have made the call, examined the needs and have advised the home owner that they would contact them again with the final estimate. This contact with the estimate has taken too long, and even in a few instances, the call back with estimate was not made. This situation has been true with both large and small contractors. We have found, too, in our city that some of our contractors do not have any real salesmen on their payroll. The man making the call often is a journeyman, or estimator, and can give the estimate of work to be done, but cannot utilize the necessary salesmanship to close the sale. And, too, some of the contractors have been quite busy and have neglected this phase of the business because of lack of time and shortage of personnel.

Another thing that we have found out is that this particular type of work is such that the husband and wife both are in on the decision. Therefore, calls after five p.m., on week-ends, and so on, are required in order to complete the sale. For union electrical contractors this poses a problem, particularly if journeymen or estimators are involved. Those few who have sales personnel, of course, can make calls at these odd hours.

Industry co-operation

Fortunately, we have a splendid group of contractors in Kansas City and have had an opportunity to sit down with them on several occasions in the past 60 days to discuss these problems—with only one objective in mind — to make the program work. No one has pointed an accusing finger at anyone. We have all tried to analyze the problem and take steps to improve the operation.

We realize that in our program we have what could be considered high standards for the minimum job. To date we have not relented a bit on our standards, and as of now, at least, we plan to continue our standards as originally established.

As a result of all of our local meetings on this subject, we have come up with a plan that may solve the salesmanship problem. The NECA contractor group in Kansas City have employed a specialty salesman to go out on the wiring calls. This particular individual has had a great deal of experience in selling, and besides carrying a union card, has owned and operated a successful contracting business in the past. This man is on the contractor's payroll, and has been making calls on all of those who have responded to our advertising. He started in February, and he too is finding it necessary to make a great many call-backs when the husband is at home — which means after five p.m. and on Saturday and Sunday.

Appeals employed

Our basic appeal has been convenience, comfort, efficiency, safety and economy. We have utilized the "octopus, blackouts, current-starved appliances, slow operation, bad TV" and other approaches in pointing out the advantages of wiring modernization.

We have found no great difficulty in getting the agreement forms, credit applications and other papers properly executed. We have attempted to simplify our forms and cut the number of them to a minimum.

Everybody connected with the program in Kansas City feels that it will snowball. All of the many benefits will make for better relations in the entire industry. We are aware that our starting time may not have been the best, but circumstances were such that we were unable to start it earlier in 1954. We have, by the way, noted an increase in interest since resuming our promotional and advertising program in mid-January.

The people interested in making this program a success in our city firmly believe that our advertising and promotion has made the general public aware of the fact that such a program is underway—that it is possible to have a wiring modernization job done on the installment plan with billing on the monthly electric service bill. We are also of the opinion that the number of requests for literature, along with the high percentage of persons wanting the contractor to call and make a free estimate are more than satisfactory. This in view of the amount of money spent in advertising and the fact that our advertising has been running only three months.

It's too early to comment on changes that might be recommended in our plan, but we are following it closely and will make changes where necessary in order to insure the success of our operation. The biggest shortcoming, as I pointed out earlier, is in the lack of salesmanship. If we find that our present experiment of a specialty man is good, we will elaborate on that phase. If we find it unsatisfactory, we will take other steps to try and remedy the situation.

by P. M. Rutherford

General Sales Manager
Dallas Power & Light Co.

Question: *What decided your organization to tie-in with banks instead of permitting Customers to pay for wiring improvements on the electric bill?*

Answer: Dallas Power & Light Company's service area is limited to the Greater Dallas area, comprising the central portion only of Dallas County. This rather concentrated urban area is served by 22 commercial banks, twelve of which (in the suburban areas) are designated agents through which customers may pay their electric service bills.

These banks are all aggressively seeking to lend money, not only for

reconstruction but for appliance financing as well. Several of them maintain continuous advertising programs selling financing of home improvement loans.

Our company's decision to tie-in with the banks is based more on the thinking that there is no need in Dallas for the company either to finance the wiring or act as a collecting agent for others.

Our customers' bills are already becoming larger and larger because of an extremely rapid growth of air conditioning. We are reluctant to add further to the size of our customers' bills unless it is for the sale of additional electric service.

Question: *In the case of bank or FHA financing, do you find the time required for credit clearance a limiting factor?*

Answer: No. From surveys which we have made around among the appliance dealers and electrical contractors, we find that there are very few instances in which time required for credit clearance is a handicap. In fact, when the contractor or dealer has established a good working liaison with one or more banks, the credit may be cleared over the telephone and the contractor or dealer handles the signing of all papers required directly with the customer.

Credit checks

In cases where the customer has not, himself, established proper credit either in the Red Book or directly with the bank, and a routine check is to be made, the lapsed time will vary from 24 to 72 hours. Even so, we do not find any great evidence that sales are lost because of the time required.

Question: *To what extent are electrical contractors in general taking advantage of installment-plan promotions as a source of residence wiring modernization business?*

Answer: This is an interesting question, but one difficult to answer briefly. Actually, we probably have only a few contractors who are using the credit plan to any extent. These will be the better organized contractors who have office personnel and bookkeeping facilities, which are required to enter into activity of this sort. Out of approximately 140 electrical contractors registered to do business in Dallas, we probably have about a dozen that are interested in residential remodeling. We have a report of one such contractor who in 1954 maintained 17 men wholly on residential rewiring, and grossed about a quarter of a million dollars.

We have found that the better contractor, to compete successfully in this field, must have a specialty group skilled in residential wiring, to do nothing else. Seven or eight of our contractors are beginning to do this, and we believe this number will grow rapidly as the volume becomes greater. This is a field in which the utility apparently can help most by direct stimulation with the customer, urging that a more complete job of wiring be done when there is *any addition* to be made.

Seasonal lag

Our contractors point out that during the late spring and summer months when so many people are installing air conditioning, they are extremely busy and have less time to follow-up leads. These contractors urge that remodeling programs be conducted during winter and early spring months when there is more time available.

Question: *When bank loan or FHA financing is used, is much difficulty encountered in getting agreement forms, credit applications, etc., properly executed?*

Answer: Yes. Most of the present forms being used are very detailed and require the skill of a trained person for filling them out properly. That is the reason why an office force is required by the contractor to handle this detail. If credit application forms could be simplified, not only could less time be taken, but probably additional contractors would be willing to avail themselves of this sales aid.

Question: *What results have been obtained through bank-financed credit plans?*

Answer: Our program in Dallas is quite new and no data is available at this time on the number of jobs that have been financed, either through the banks' own plan or through the banks' financed FHA Title I. We do know, however, that interest is growing, and we have seven or eight contractors who are making some use of credit financing.

Question: *As a result of experience, what changes would you recommend that would help make these programs more effective?*

Answer: We have talked with the banks and with a great many of the electrical contractors, all of whom believe that some headway has been made. What is indicated now is stepping-up the consumer promotion to create a greater demand for rewiring. We have found that our banks on the whole are willing to finance wiring loans from about $100 on up, and they are beginnig to use both newspaper and radio advertising to solicit such business.

The banks point out that it would be better for all concerned if the customer's appliance purchase and the wiring can be included on a single loan. This is done in the case of the larger department stores who sell the appliances and actually do arrange for and handle the wiring also. But in the case of the smaller dealers, especially when air conditioning is sold, there is a strong tendency to overlook the wiring and let the customer shift for himself.

Our company's approach to this entire problem can be summarized as follows:

Our advertising and promotion will be directed entirely to the rewiring market, thinking in terms of a customer finding it necessary to rewire on account of air conditioning, the electric range or drier.

The customer will be urged to do the whole job of wiring while he is at it. We will point out that it is cheaper and better in the long run to install an adequate service entrance, electric range plug, electric drier plug, and any other special outlets that will be required for electrical living.

This story will be told over and over again to the customer, to the electrical contractor, and to the electrical dealer.

We know from individual cases that the story we propose makes sense, and is being used successfully by several of the electrical contractors. We believe that an approach of this sort will not only help sell rewiring, but will have a wholesome effect on our approach to wiring for new construction.

by Don Willis

Vice-President in Charge of Sales
Arizona Public Service Co.

Question: *Why did your organization permit customers to pay for wiring improvements on the electric bill?*

Answer: Our company undertook a "pay as you go" wiring

(*Continued on page 92*)

Highlights of National Adequate Wiring Conference

◆ "THE WIRING systems in most homes are like the single-lane, dirt roads of yesterday — built for horse-and-buggy travel and not at all suitable for the heavy automotive traffic of today.

"The copper highways in most homes—in fact, in most occupied buildings — are single-lane, dirt roads when present-day electrical traffic is considered. They must be rebuilt for the electrical traffic of Modern Living.

"Inadequate wiring is such a big handicap to so many different groups it is a little difficult to comprehend just how the problem mushroomed as it has.

"The only answer, apparently, is that it costs money to correct the condition in existing buildings and to prevent it in new ones. And people are not as willing to spend money for concealed wiring as they are for more readily seen articles with glamour appeal like TV sets, automatic washers—or fur coats.

"Inadequate wiring hurts just about everybody but our friends in the gas business." — **John W. Evers, President, Commonwealth Edison Company.**

* * *

". . . electricity is truly the genie from Aladdin's lamp for this century. The surface has scarcely been scratched both in the development of ideas in labor saving equipment and in the salesmanship so necessary in bringing these ideas to the ultimate consumers. Our experience in selling to the farm market tells us that it is not an easy job. We're convinced, however, that it can be done. The farmer needs labor saving devices and he will buy them provided they serve his needs, reduce his operating costs, and fit in well with his farming program.

"Much of the wiring on today's average farm is from 15 to 20 years old. At that time the home and occasionally a barn was wired solely for lighting. It was a tremendous stride forward for those who put away the flame lamp for the last time. The uses of electricity continued to grow, but, unfortunately, the power carrying wires did not grow and today we have some serious cases of overloaded wiring.

"During World War II, when there was more money available than there was good merchandise, many farm wiring jobs were expanded with low quality materials because first class materials were out to war. Some of this rewiring was done on a temporary basis. However, a good bit of this tired wiring is still trying to do a job it wasn't ever intended to do. This is the situation as it exists today. A better market could not exist. However, those who go into it will find it a real sales challenge." **—Leo O. Stoeber, Manager, Farmers Electric Service Center, Bloomington, Illinois.**

* * *

"Farmers are impressed with the materials in stock in their local stores. Such materials are rarely adequate for good farm wiring. We are inclined to feel that 200 ampere main entrance equipment, 100 ampere service panels for the home and a complete installation of wire-ways and service cabinets for the barn should be made available for county fairs, annual meetings and the state fairs. If farmers can be shown the large equipment that is needed they will realize that the small equipment now installed is absolutely inadequate." — **C. P. Wagner, Farm Electrification Consultant, North Central Electrical League, Minneapolis, Minnesota.**

* * *

"From our experience of the past year, it is easy to see that wiring—adequate or inadequate—is a distasteful subject to the appliance salesman. He may recognize and sympathize with adequate wiring promotion as a crusade for better living, but he's not apt to pick up a sword when it might cost him money. I have a neighbor who has just recently wired in a dryer which she purchased several months ago. She actually didn't know until after the dryer was delivered, that it didn't plug in like a toaster. Her salesman just wasn't taking any unnecessary chances. Too often any discussion of wiring is the dangerous passage which may scuttle his sale.

"If we expect to enlist the dealers' help in promoting adequate wiring, it is going to take a consistent program of solution-type education. It isn't enough to say 'inadequate wiring stifles appliance sales.' Somebody is going to have to provide and promote a solution that appeals to the dealers' self-interest." — **W. L. Tait, Appliance Sales Promotion Manager, Portland General Electric Company, Portland, Oregon.**

* * *

"Farmers are buying electric equipment in greater volume today than ever before in the history of the electrical industry. Why are they buying? Because they have been sold on the idea that it is smart to electrify. Electric labor saving equipment makes farming more profitable as well as more enjoyable and is contributing much to the progress and welfare now enjoyed by agriculture.

"Yes, farm electrification has become of age. The average annual kwh used on farms is doubling itself in eight-year periods. The key to future load growth on farms is adequate farm wiring, which has not kept pace with appliance and equipment sales. As a result, much of the equipment in use on farms is operating at a very low efficiency, in fact, in many instances the use of equipment is regulated by the farmers to conform with the wiring capacity of the farm.

"200 million dollars is a whale of a lot of money, yet that is a conservative estimate of the potential wiring business available on farms for 1955. However, if history is to repeat itself this year, the industry will get about 50 million dollars in farm wiring. What happens to the other 150 million dollars of potential wiring business?" — **R. T. Jones, Manager, Farm Sales, Pennsylvania Power & Light Company, Allentown, Pennsylvania.**

◆ A PLANNED COMMUNITY of 1,150

"The electrical contractor is in a rather singular position when it comes to the promotion of wiring. Not only is electrical wiring in competition with other elements that make up a building, because home owners like pink bathtubs and stainless steel kitchen countertops and knotty pine recreation rooms, but we are also in competition with other electrical contractors who think that home buyers only desire a low price and consequently an insufficient amount of electrical wiring. It is our experience that wherever we can impress upon the builder that Certified Adequate Wiring is the only standard of wiring of the electrical industry, we then have a chance of getting a good job at a fair price.

"The argument so often used by builders is that the lending institution will not advance additional money for extra wiring. If the F.H.A. will up-value the mortgage insurance on homes built under F.H.A. plans, I am certain that other lending institutions using conventional financing will follow suit. One of the biggest arguments the builder now has against laying out extra money for Certified Adequate Wiring will be overcome." **— William Veldhouse, President, Service Electric Company, Chicago, Illinois.**

* * *

"A few months ago I attended a meeting in Atlantic City where I heard some wonderful predictions about the future of the electrical manufacturing industry. According to the speakers, an average of eight additional new appliances should be sold to every home in the United States during the next five years—a total of 428 million! They also estimated that the electric utilities of the country should be serving an average annual residential kilowatt hour consumption of 5,000 kwh by 1963.

"Naturally, such growth would be reflected in additional business for appliance dealers and distributors, and, ultimately in a greater prosperity for manufacturers and installers of such equipment as power transformers, switchgear, breakers, distribution transformers, voltage regulators and the like. All in all, there was painted at that meeting one of the most glorious pictures of future electrical industry growth you or I or anyone could ever hope to see.

"All the questions which nor-

(*Continued on page 91*)

Missouri utility's credit plan boosts adequate wiring in area

◆ UNION ELECTRIC Company of Missouri has recently announced and introduced to dealers in its service area the Reddy Credit Plan, and various types of sales promotional materials and advertising are now being prepared for distribution in connection with the plan.

The Reddy Credit Plan is a financial arrangement which has been made between Union Electric and several lending agencies for the purpose of "making available to a larger percentage of individuals in the Union Electric service area the benefits and comforts of electrical living" through wiring modernization. The plan will be available to all individuals in the service area who are residential customers of Union Electric, who comply with the terms and conditions of the plan as stated in the printed contract, and who are acceptable to the lender as a credit risk.

Appliances designated

Under the agreement, loans will be granted qualifying individuals for the purchase of ranges, water heaters, clothes dryers, or food freezers, including the wiring and installation costs of any such items, or for wiring only which may be required to modernize and enlarge the wiring in the customer's residence. Amount of the loans has been stipulated as not less than $180 and not more than $540. Down payments are limited to a minimum of $6.00, and monthly payments will be in even dollar amounts of not less than $6.00 or more than $15, for the specified period of from 30 to 36 months.

The borrowing customer will have the right to prepay all or part of his obligation at any time, and the lender, in the case of prepayment, will give to the customer such credit for unearned financing charge as the customer would receive under the lender's regular policy. The financing charge on a loan or an extension of credit made by the lender is not to exceed two-thirds of one per cent per month on the initial principal amount financed.

Union Electric has agreed to advertise and otherwise promote the Plan to whatever extent it deems advisable for the purpose of informing Union Electric Company's customers, appliance dealers, electrical contractors and plumbers of the plan and encouraging its use. The utility has also agreed to supply to the lender information as to whether or not the applicant is a residential customer of Union Electric, and if so, for how long a period the applicant has been a customer at his present address.

Uninsured purchases

Within 30 days after receipt from the lender of a summary report of loans and extensions of credit, the utility has agreed to pay the lender $5.00 for each purchase financed which is not covered by FHA insurance.

In order to assist Union Electric in evaluating the Reddy Credit Plan, the lender will submit to the utility a report of each loan or extension of credit which is defaulted and the amount of loss incurred thereon. It will also be the responsibility of the lender to administer the loans, using such forms and other papers as they devise for the plan, and to make satisfactory arrangements with appliance dealers, electrical contractors and plumbers as may be necessary to carry out the plan. These arrangements may include the proviso that the dealer, contractor, or plumber from whom such purchase was made shall make a payment to the lender in an amount not to exceed $5.00 for each purchase financed. The agreement may also include an assumption of liability by such dealers, contractors, or plumbers, for the unpaid balance of a customer's obligation if the customer fails to

(*Continued on page 91*)

Houston residential section features ample street lighting

To light the 16 miles of paved streets serving a Northwest Houston residential area, 210 Carco steel light poles equipped with 6.6 ampere Stero-Lite Jr. street lighting bulbs, manufactured by Line Material Co., are being installed. The poles were recently developed by Pacific Car and Foundry Co., Renton, Wash. The 2,500 lumen lamps, spaced alternately at 250 feet, will provide an average surface illumination of from .01 to .02 footcandles. Frank W. Sharp Construction Co., of Houston, is owner and developer.

◆ A PLANNED COMMUNITY of 1,150 families in Houston, Texas, will soon be able to boast of one of the best lighted residential areas in the country. On the 16 miles of paved streets serving Sections 15 and 16 of the Oak Forest Addition in Northwest Houston the Frank W. Sharp Construction Co., owner and developer, is installing 210 steel light poles. Spaced alternately at intervals of 250 feet, incandescent lamps provide an average surface illumination of from .01 to .02 footcandles.

The lamps are 6.6 ampere street lighting bulbs with an output of 2,500 lumens each. The poles were recently developed to meet residential street lighting requirements of economy and good appearance.

The modern steel poles spaced evenly on both sides of the streets add to the attractiveness of the community. An underground wiring system keeps the streets free of overhead wires; all exposed wires for other facilities are located out of sight at the rear of the houses.

The total cost of Sections 15 and 16 of Oak Forest, when completed sometime in 1955, will amount to over $16 million. At present, 650 homes are occupied out of the 700 completed or near completion. An additional 450 homes will be completed this summer. When finished, a total of 1,150 homes will occupy this site with an expected population of almost 4,000 people.

Sections 15 and 16 are the most recent extensions of Oak Forest, an eight-year-old subdivision with 5,500 homes and an estimated value of $55,000,000. Cost of the lighting installation alone in these new sections will amount to more than $73,500. Beginning in September of 1953, the poles and fixtures have been installed as the new sections progress.

Credit for job

Installation of the lighting equipment is being done to the specifications of the Houston Lighting and Power Co., by the Wert Sharp Electric Co. of Houston, installation contractor. Engineering was done by the Frank W. Sharp Construction Co., under Robert E. Jordan, manager.

Oak Forest Addition is not alone in the use of modern steel light poles in this area. The city of Houston itself is in the middle of installing 249 similar steel light poles in the downtown area.

Know the law

by Arthur L. H. Street

Project contractors must co-ordinate work

◆ THE OWNER of a drive-in theatre project let one contract to a grading contractor and another to an electric contractor for installation of the required electrical work. Were both contractors bound to so co-ordinate their work as to avoid injuring the work of each other?

The Texas Court of Civil Appeals, Dallas, answered this question "yes," and upheld the right of the electrical contractor to hold the grading contractor liable for loss resulting from wiring destroyed in the process of grading. (Southwest General Construction Co. v. Price, 267 S. W. 2d 855.)

Place of responsibility for defective wiring

◆ TO THE EXTENT that electrical contractors and suppliers of electrical equipment make property owners aware of the legal risks they run in neglecting to have wiring and other electric installations maintained in safe conditions, contractors obviously render a very valuable public service, as well as promote patronage for themselves.

The foregoing thought is inspired by a reading of the decision lately rendered by the South Carolina Supreme Court in the case of Carroway v. Carolina Power & Light Co., 84 S. E. 2d 728.

Case in point

The specific decision in that case was that plaintiff, a tenant of residential property, had no valid damage claim against the defendant power and light company for removing an electric meter under orders of the city electrical inspector because of defective wiring, lack of sockets, etc., in plaintiff's home; the meter having been restored promptly when the defects had been repaired. (Incidentally, the opinion of the court shows that an occupant or owner of a building runs other and more serious risks unless he assures himself that the electric system is in safe condition.)

The power company had a rule, which had been approved by the State Public Service Commission, to the effect that delivery of electricity might be suspended, in case of a condition on customer's side of the point of delivery actually known by company to be, or which the company reasonably anticipates may be dangerous to life or property.

Termination of service

The city of Florence, where the case arose, had an ordinance containing safety regulations and maintained an electrical inspection system. Attention has been drawn by the fire chief to defective wiring in the house occupied by the plaintiff. The electrical inspector got no results when he attempted to get assurance from the owner that the condition would be remedied, so he notified him that the power company was being ordered to suspend service until satisfactory repairs should be made.

Three days later the service was restored when city authorities notified the company that the necessary repairs had been made.

The tenant sued the power company for damages for removing the meter and a jury decided in his favor. The company successfully appealed from a judgment that awarded damages in favor of plaintiff.

Defects in question

Here are defects involved in this case. Sockets and drops in each of the three rooms of the house were gone. A radio was connected by tying wires together. A switch box had "jumped out," making the fuse in it ineffective. The box had been pulled off the wall and the switch was thrown without effect. The situation was dangerous, the electrical inspector testified, because there was no fuse protection. He testified:

"Q. What was the danger, in what respect was it dangerous, what were you afraid might happen? A. The lack of fuse protection, over current protection would permit the line voltage or current to come right into the house, it could build right up until your fire actually got started, it could build up in case of trouble on the line, the Power Company's side, to where your power would jump across the wires and it would be a generally dangerous situation for anybody to get into the vicinity of it or touch it.

"Q. It would be dangerous to anybody who might touch it or dangerous too, from a fire hazard? A. Yes, sir."

Plaintiff's lawyer argued that the condition of the wiring was not so urgent as to require shutting off the current. But the Supreme Court replied:

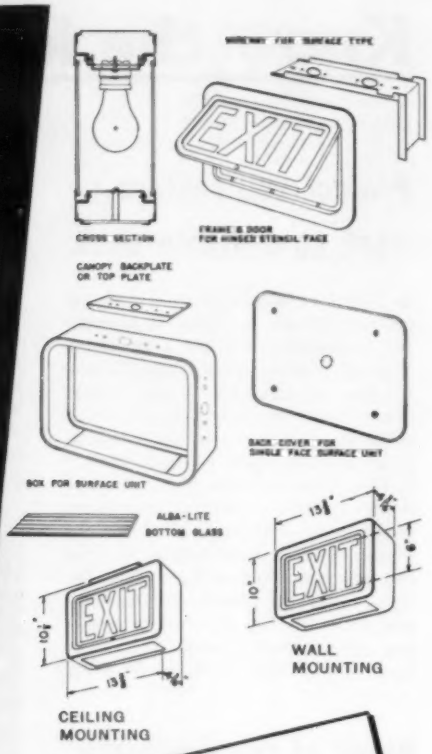
Supreme Court ruling

"It is true that he testified that the wiring was in the same condition that existed when he moved into the house and that although he had been living there almost two years, the wiring had never caught on fire or given any trouble, but we do not think that this has the effect of contradicting the testimony of the experts as to the dangerous condition of the premises. No doubt the tenant who lived in the house next door could have given similar testimony prior to the fire at his house the previous Saturday. Neither municipal authorities nor the defendant were required to wait until there was a fire before undertaking to make immediate correction. Suppose there had been a delay of a few days in cutting off the current and plaintiff's house had burned down the night after this condition was called to the attention of the defendant by the municipal authorities with instructions to cut off the current, could there be any doubt as to the liability of the defendant?"—the power company. "Surely it was not necessary to endanger the property and lives of the plaintiff, his family and others for a few days in order to accommodate the convenience of the plaintiff, or his landlord. Recognition for the necessity for immediate action is found in the rules and regulations authorizing the discontinuance of service without notice where the situation is dangerous."

(*Continued on page 90*)

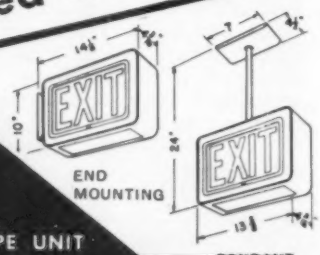
SURFACE TYPE UNIT
STENCIL FACE STYLE

Now it's possible to use one basic die-formed exit sign throughout an entire building. Quickly converted to single or double face use, The Perfeclite Surface Unit, is mounted from top, back, side, or from a pendant, depending on your requirements. Wiring is no problem. The wireway simply disengages through key slots. Two face styles available: hinged metal stencil face, 6" letters on fired green or red glass backing — or 6" letters on fired ceramic glass panel — in four color combinations.



ADAPTABLE — is the word for PERFECLITE'S new hinged exit unit

Specify Perfeclite Recessed Mounted Illuminated Exit Signs . . . die-formed, easy-to-install, easy-to-service. Two face styles: hinged metal stencil face, 6" letters on fired green or red glass backing, or 6" letters on fired ceramic glass panel — in four color combinations.



RECESSED TYPE UNIT
GLASS FACE STYLE

All signs are fired ceramic colors — unconditionally guaranteed. *Units are Underwriters Laboratories, Inc., approved, and comply with National Electrical Code.*

THE PERFECLITE COMPANY
1457 East 40th Street
Cleveland 3, Ohio

Please send me The Perfeclite Data Folder EX-55A.

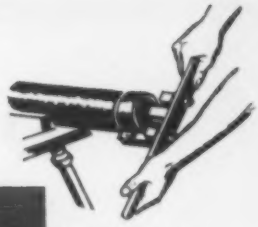
NAME .....

ADDRESS .....

CITY ..... STATE .....

SMOOTH BORE
NO SCORING OR
ABRASION OF SHEATH

EASY TO
INSTALL



EASY TO TOOL

The Happy Combination

CUTS WITH SAW

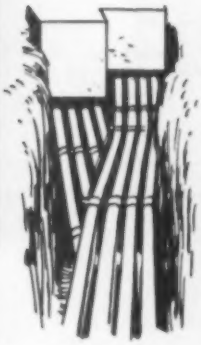
LIGHT - EASY
TO HANDLE

Complete Protection... Long Life...Low Cost

ORANGEBURG
NOCRETE

COMPLETE LINE OF
INTERLOCKING PLASTIC SPACERS

WATER TIGHT JOINTS



ORANGEBURG
STANDARD

HOW does Orangeburg give cables complete protection? It's tough and strong. It's resilient, and "gives" without cracking or breaking. Its walls are impermeable. Its non-metallic material resists acids, alkalies, oil and salt in ground waters. Its joints are watertight. Its smooth bore reduces danger of abrasion.

WHY such low cost? Because Orangeburg is lightweight and easy to install; it lays faster than any other type of conduit . . . saves time and money. The long 8-foot lengths mean fewer joints to make. The Taper Sleeve Joints seal watertight with a few light taps. It lasts indefinitely . . . gives years and years of economical service.

Orangeburg is a leader in every city and state. For data about Fittings, Angle Couplings and Bend Sections, write Dept. ES-45.

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ORANGEBURG®
FIBRE CONDUIT

STANDARD INSTALLED WITH CONCRETE

NOCRETE INSTALLED WITHOUT CONCRETE

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ELECTRIC COMPANY

DISTRIBUTORS,
ORANGEBURG
FIBRE CONDUIT

BRANCHES AND STOCKS IN PRINCIPAL CITIES

GENERAL ELECTRIC
SUPPLY COMPANY
A DIVISION OF GENERAL ELECTRIC DISTRIBUTING CORPORATION

Distribution substations

Part III

◆ THERE ARE ABOUT as many possible types and variations of substations as there are people with ideas about designing substations. For simplicity, most substations can be identified as one of the following five basic types:[7]

1. Radial
2. Primary Network
3. Spot Network
4. Low Voltage Selective
5. Duplex

The choice of type depends upon the quality of service to be rendered, the type of load being served, cost, system geography, and future load growth requirements.

In addition to the basic type, several other questions must be answered in order to completely describe a substation and its functional arrangement. These include:

1. What subtransmission pattern is used?
2. What protective devices are used on incoming lines—fuses or breakers at the substation, breakers at the subtransmission substation, or a combination of these?
3. Is bus, individual feeder, group feeder, or combined bus and feeder regulation employed?

These questions may be answered in one or more ways with each of the five basic substation types.

[7]References will be found at the end of this article on page xx

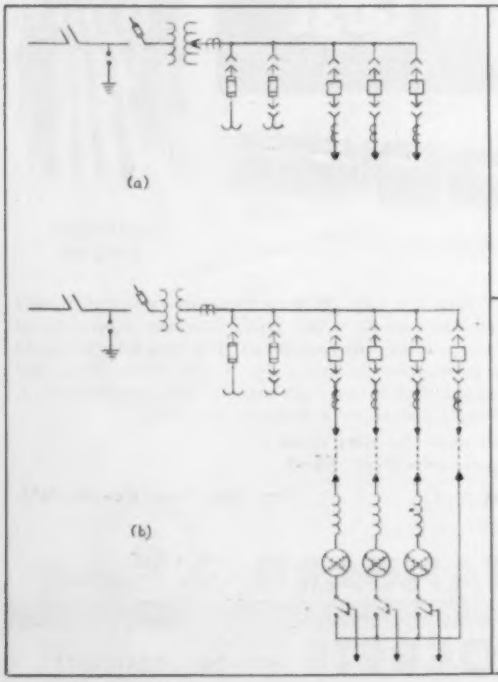

Fig. 7—(a) Typical one line diagram of a radial substation with bus regulation and radial subtransmission. (b) Typical one line diagram of a radial substation with individual feeder regulation by means of the regulator-reactor-transfer bus scheme.

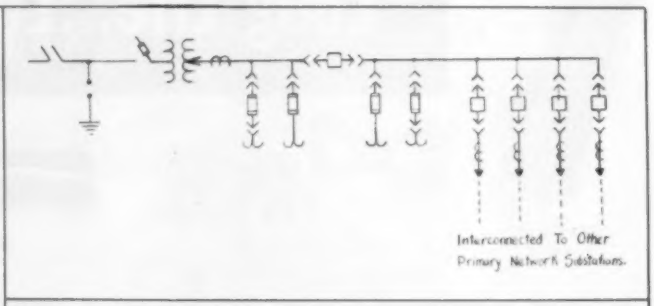

Fig. 8—(Above) Typical one line diagram of a four feeder primary network substation, incoming line fused.

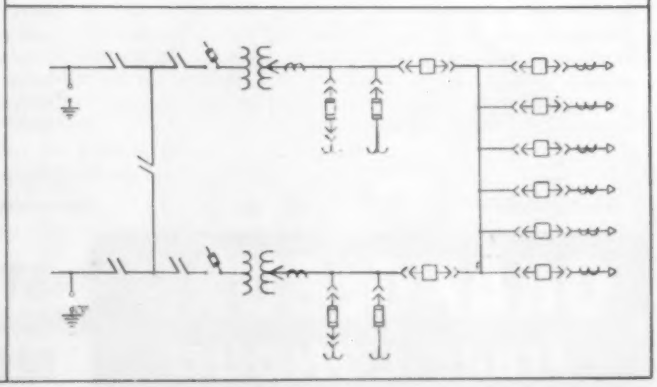

Fig. 9—(Below) Typical one line diagram of a six feeder spot network type substation with bus regulation.

THE UTILITY ENGINEERS' FORUM

in system planning

by H. M. Bankus
Electric Utility Engineering Section
General Electric Company

The first two questions are covered in considerable detail in a companion paper.[8] A discussion of the third question along with the general arrangement and functional switching scheme of each of the basic types will follow.

Standardized substation construction normally makes use of three phase transformers. With the reliability of present day transformer construction, it is not common practice to provide a spare unit. When a transformer is out of service for maintenance or during construction, the load can be served by a mobile unit.

The mobile substation can be

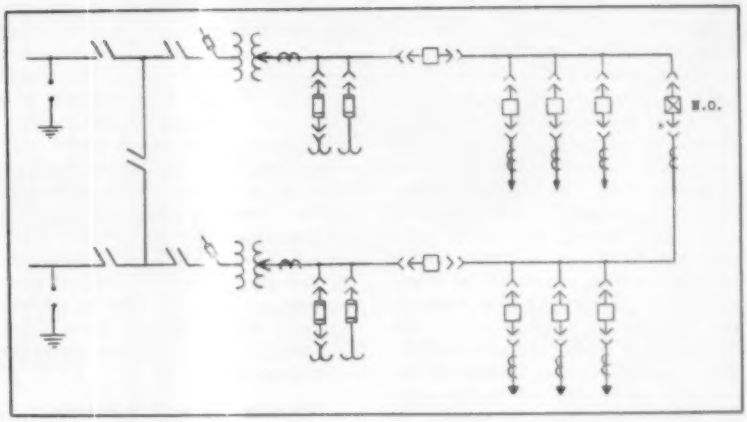

Fig. 10—Typical one line diagram of a six feeder low voltage selective type substation with group bus regulation.

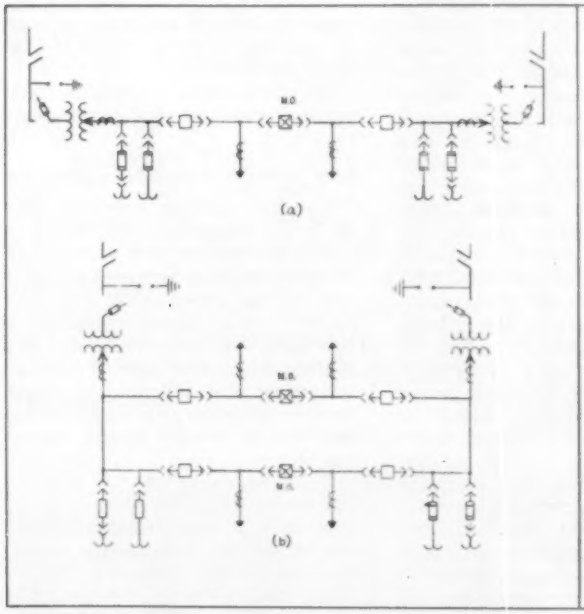

Fig. 11—(a) Typical one line diagram of a duplex type substation (two feeders). (b) Typical one line diagram of a double duplex type substation (four feeders).

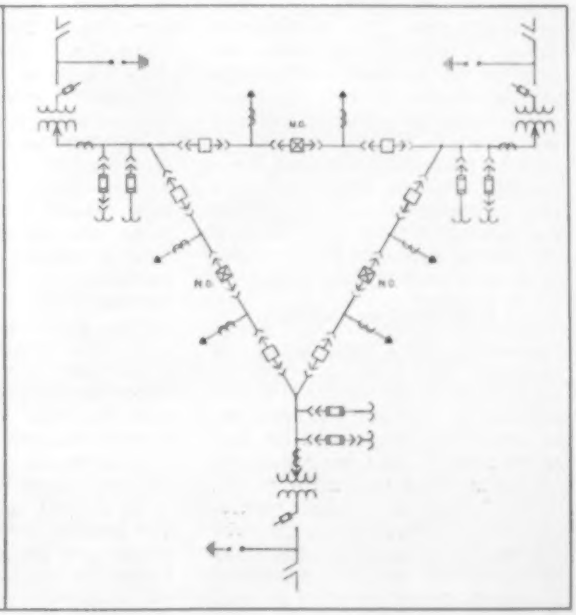

Fig. 11(c)—One line diagram of a six feeder multiplex type substation. A multiplex substation can contain any even number of feeder positions greater than four.

considered to be a sixth general type. It is an emergency device and can be used to temporarily by-pass or increase the capacity of any of the standard types during emergencies or periods of abnormal peak load conditions, or it can be used by itself to serve loads of short duration.

Radial substation

The simple radial substation is characterized by a single electrical channel from the substation input to the load. Fig. 7a shows a typical one line diagram of a radial substation with one subtransmission source. An equipment failure within the station will necessarily cause an interruption of service until the trouble has been cleared or temporary relief measures have been taken. However, many utilities have found that the excellent reliability of the transformer and switching equipment warrants application of the radial substation, particularly in the low-density load areas. By employing cutover facilities on the feeder circuits, outage times can be minimized by permitting the load on the feeders in trouble to be fed temporarily from adjacent feeders. This procedure also allows maintenance of equipment in the substation without loss of service to the customers.

Since loss of the transformer would normally mean a complete outage of the station, it is only necessary that the transformer rating be sufficient to serve the sum of the ultimate peak loads on the various feeders. However, in the event that cutover facilities are provided on the feeders, it may be advisible to provide some margin between peak load kva and substation rating to prevent the substation from being unduly overloaded when the remote feeder cutover switches are closed.

Individual regulation

Usually the transformer is equipped with load ratio control equipment to provide automatic bus voltage regulation. If additional regulation is required on any of the feeders, separate regulators can be included out on the feeder itself. Individual feeder regulation can be employed at the substation by eliminating the load ratio control and by providing a regulator-reactor-transfer bus. This, however, is a much more expensive alternative than bus regulation. Fig. 7b shows a one line diagram of a radial substation using the regulator-reactor-transfer bus scheme.

Relaying of this type of substation is simple and usually consists of a set of overcurrent relays and a reclosing relay (for overhead lines only) on each feeder.

The single circuit integral unit substation is a special case of the radial substation and finds application in rural and suburban areas, and in new developments where load is not sufficient to justify more than one feeder breaker position. It differs from other radial type substations in that the substation is complete in one piece. One low voltage breaker is mounted in a compartment on the side of the transformer. High voltage fuses and lighting arresters are frequently mounted on the transformer. Thus no high voltage steel structure is required for connections to overhead lines when only one incoming subtransmission circuit is provided. With only one circuit, load ratio control naturally provides individual feeder regulation. An additional advantage of the single circuit integral type substation is that it can be picked up and moved in one piece. This naturally results in low installation cost.

Primary network substation

Two or more unit substations paralleled on their low voltage sides through an interconnecting grid form a primary network system. (Fig. 8) The primary network substation is similar to the radial type substation except that it has a main transformer secondary breaker. This breaker is equipped with directional relays to trip when there is a fault in the transformer or the subtransmission circuit. During this condition, there is no interruption of service; the load is shared by the adjacent substations in the network. This feature is also of use while maintaining equipment in the substation. The transformer rating of a primary network substation must be correspondingly larger than for the straight radial to prevent excessive overload when one substation is out of service. Voltage relays are also included to reclose the transformer secondary breaker when conditions are proper for the substation transformer to again supply power to the network. Overcurrent and reclosing relays are used on the feeder breakers.

Each substation transformer is equipped with automatic load ratio control to provide bus voltage regulation.

Primary networks are usually fed from two or more subtransmission circuits arranged so that no adjacent substations are out of service in the event of a fault on one subtransmission circuit.

Spot network substation

The spot network substation provides a high degree of service continuity for a concentrated load area such as a downtown low voltage network supply, or a large industrial load. The spot network substation is a double-ended unit having two transformers operating in parallel. Fig. 9 shows the typical spot network substation arrangement. Should a transformer fail or should there be a subtransmission outage, the associated transformer breaker would open, and the entire load would be fed by the remaining transformer without interruption. Each transformer should have a rating such that it can carry the total load with a reasonable overload at its fan-cooled rating during emergency conditions.

Each transformer should have its own subtransmission supply.

The transformer secondary breakers have reverse-current and back-up overcurrent relays, and voltage-reclosing relays. Outgoing feeders are equipped with standard overcurrent relay equipment. The feeder breaker interrupting capacity should be large enough to interrupt a short circuit fed by both transformers.

A single level of bus voltage regulation is provided as indicated by Fig. 9.

Low voltage selective substation

The low voltage selective substation is essentially two adjacent radial substations with a normally open tie breaker between the two low voltage buses. (Fig. 10) The transformer secondary breakers are equipped with undervoltage relays so that in case of loss of voltage on either bus, the proper transformer secondary breaker opens and the tie breaker closes, restoring service.

One advantage of this type of substation over the spot network type is that the feeder breakers can be smaller because the transformers are not operated in parallel, thus reducing the available short circuit current. Another advantage is that the two buses can be separately regulated, giving in

(*Continued on page 90*)

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Techniques and equipment for supplying tomorrow's electrical loads

by A. C. Monteith

Vice-president in Charge of Engineering and Research, Westinghouse Electric Corp., Pittsburgh

◆ WITHIN THE NEXT FEW MONTHS, each of you in this room, either directly or through your subordinates, will hire a young graduate engineer. I want to spend my allotted 20 minutes today talking to you about this young engineer. If you wonder what he has to do with my subject, which is techniques and equipment for supplying tomorrow's load, I will try to satisfy you on this point.

It's hard to believe, but this young man was born only a short time ago—in the year 1933. He never really knew there was a depression. He was eight years old when Pearl Harbor was bombed and twelve when the first atomic bomb was dropped.

When this young man starts to work for you, your accounting office will deduct two percent of his pay, up to $4,200, for his old-age retirement. He will start collecting that around the year 2000. I find that hard to believe too. Until recently, the year 2000 was always a misty, far-off Jules Verne era to my generation — and probably to yours. If I may say so, the future seems much closer now than it used to.

Future SEE members

The young engineer you hire next month will be in this audience or on this platform 20 or 30 years from now. Or he may be sitting behind your desk back at the office, probably worrying about the caliber of the young men he is getting from engineering school.

You know better than any other audience I could talk to that the power industry will face problems of unheard-of complexity and magnitude in the coming decades.

The point I am trying to make is this: If these problems are to be met and overcome, then the same young engineers we are hiring today are the ones who eventually will have to do it.

Let's take a look at some of the problems that you, your immediate successors, and the young engineers of today will be facing tomorrow.

Future in statistics

On the basis of our projected energy demands, we expect your total installed capacity in 1965 to be 215 million kilowatts, double today's figure. Your energy sales will total approximately 850 *billion* kilowatt-hours, again more than twice last year's sales. Residential consumption should exceed 5,000 kilowatt-hours annually. The 1954 average was 2,540 kilowatt-hours. All this in ten years.

Reasonably firm estimates extend to 1975, when we estimate your installed capacity at around 400 million kilowatts. Beyond that, the guestimates become astronomical. By the year 2000 installed capacity could well be 10 to 15 times today's 100-plus million kilowatts.

Gentlemen, this is bold handwriting on the wall. With power figures like these in front of us, both the manufacturer and the utility are going to have to draw up a whole new projection in their engineering concepts. Problems in the familiar areas of engineering are getting much more difficult. In addition, the number of areas requiring first-class engineering attention is increasing. We in manufacturing will have to give you turbines designed for temperatures and pressures well beyond existing steam table data to obtain the efficiencies you must have. Radically new techniques of generator design will be needed. You will run into vast new problems of transmission and distribution of your power, of system integration and of atomic plant operation. But the key problem you will face is in manpower. In short, there is a terrific job ahead.

Manufacturer's part

As far as the equipment is concerned, the manufacturers are ready to move along with you to the bigger, more concentrated electrical systems you will be using.

We believe the industry is prepared to build turbines as large as any needed in the foreseeable future. The giant now being built for the Philadelphia Electric Company will operate with initial steam conditions of 5,000 pounds pressure and 1,200 degrees Fahrenheit—the highest temperature and pressure currently in the works. And economy calls for the use of big machines. Ratings of 400,000 kw are not far away. Still larger units are entirely possible. Efficiencies will be better, too. By tripling present-day inlet pressure and with temperatures now in the long-range planning stage, today's plant efficiency can be improved by 10 or 11 per cent.

Requirements in equipment

What about generators? As you know, we dynamited the dam in generator rating in 1951 with the introduction of inner cooling. This radical new ventilating technique, combined with better insulation, pushes the upper limit of generator ratings considerably beyond the needs of any projected installation. Equally great design achievements will continue to punctuate progress in this area.

We will need higher voltage transmission in the next few years —perhaps as high as 500 kilovolts —to handle efficiently the mounting power loads. This will call for

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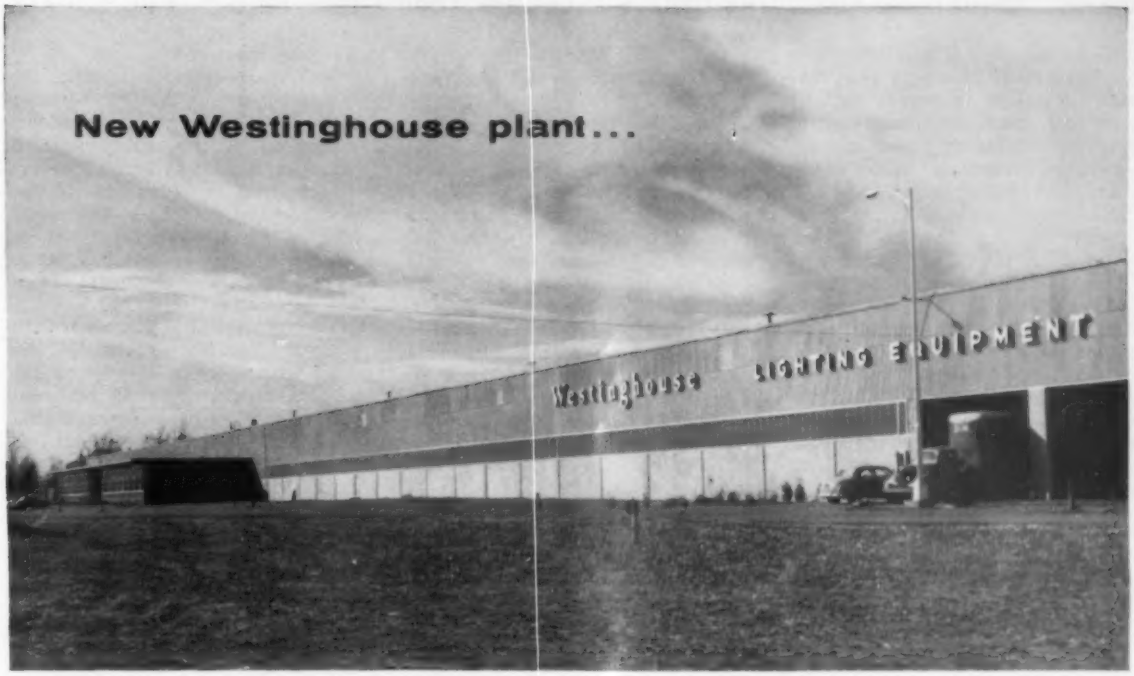
This article is adapted from an address presented to the 23rd annual conference of the Southeastern Electric Exchange, at Boca Raton, Fla.



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transformers and circuit interrupting equipment of comparable ratings, as well as improved switchgear and more automatic control systems. As far as the manufacturers are concerned, we are ready today with both the equipment and the know-how.

New distribution needed

Present distribution systems are already hard pressed. A radical overhaul in our distribution techniques is needed, starting now. With average residential consumption rising to over 5,000 kilowatthours in the next ten years, house wiring practices will change, but more important, you must plan ways of getting these large blocks of power into the homes. Higher distribution and utilization voltages are inevitable. There is already a definite trend in this direction and this trend should be accelerated. New commercial and residential areas provide excellent opportunities. True, a big educational job is needed, but we must move forward. An active program to raise distribution and utilization voltages to perhaps twice present-day standards must receive your full cooperation and support.

A whole new technology will be developed in the coming decades, not only in the way we build the equipment but also in the way you operate your systems. Load densities will be more concentrated, systems will be both larger and more closely integrated. You will find it necessary to improve your system efficiency even further by using more supervisory controls and automatic load dispatchers. The Southern Company system provides an outstanding example of what can be done in this field. Last June they placed in service a computer for determining the incremental cost of power delivered. Through its use I understand that the system's savings in production expenses are estimated at not less than $200,000 a year. This trend toward completely automatic system operation will call for the highest caliber of engineering talent.

The fuel problem

On top of all these mounting problems, we now must add a newcomer — atomic power. The rate at which this promising youngster matures is tied closely to the economics of fuel supply. Let's look for a moment at this fuels problem.

Our generation will probably not feel any real pinch due to a serious shortage of the conventional fuels, but those who succeed us will certainly be aware of it. We are approaching a critical stretch on the road to depletion. Within the lifetime of many of you in this room, the production of oil and natural gas will begin to dwindle, and coal, while still in ample supply, will have become a considerably more costly fuel. Within the next hundred years, when the population has risen to some six billion persons and the demand for power has risen accordingly, even coal will not be able to satisfy the tremendous power demands that will exist.

As coal and other fuels become scarcer and harder to extract, the more attractive and competitive will become this new source of power that science has unlocked—the power contained in the nucleus of the atom.

Atomic plants by '65

The subject of atomic power is a big one—and there is a lot of big talk going around. In the field of power generation its future is certainly bright. But its impact on this industry will be neither sudden nor dramatic. The process will be evolutionary, not revolutionary. For example, by 1965 there will be a fair number of atomic reactor plants in operation, from which we will have gained important design and operating experience. This will allow us to move to the future with confidence. By the year 2000, atomic reactor plants will represent a substantial supplement to conventional plants.

Atomic power is not simply an extension of the electrical art, but a whole new approach in the power field. The units are sealed. They are handled differently. You are, in a sense, operating blindly. There is much to be learned, not only about design, but about operation. This takes the best in brains, and in particular, young brains.

Present employment trend

When I look at these future developments, I have no doubt whatever that together we can master the engineering problems. What worries me is the young engineer I spoke of at the beginning of my talk. I worry at the possibility that we may not have enough engineers, of high enough caliber, to make full and proper use of what we have mastered.

The most ominous sign in the future picture is that the number of top-grade engineering students interested in the utility field is declining almost as fast as the industry itself is expanding. If this development continues, the rising load curve I have described so optimistically may one day reach a crisis for lack of engineers to run new power facilities.

Let me back up my concern with a few figures. Not so long ago, the AIEE completed a survey of 102 schools, representing 75 per cent of all accredited engineering schools. They found that about two out of three of the electrical undergraduates are training for electronics.

A mid-western university reports that of 90 electrical graduates in one class, one man joined a power company.

The head of the electrical engineering department of a large eastern university publicly stated that for lack of use he was going to give away his power machine laboratory.

Challenge to utilities

A recent article in *Electrical Engineering* stated: ". . . the (utility) companies are steadily running themselves into the ground by failing to attract young men of high intellectual capacity to the profession. If nothing is done, many schools probably soon will be forced to cease offering a heavily emphasized power program."

I don't like this any more than you do. I know very well that you are quite aware of this serious problem. I mention it now only to show that the electrical manufacturing industry shares your concern and to tell you what we are doing to help you counteract this development, in the hope that the information may prove of use to you. You should study this problem now to determine how you can contribute. The schools need your help. Their costs have increased and the present tax situation has virtually eliminated large donations from individuals.

If I describe the work of Westinghouse in this field, it is only because it is what I know best and am qualified to talk about. Other electrical manufacturing companies are contributing with programs of their own.

For the past ten years, my company has been supporting the

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Westinghouse Educational Foundation, which provides a very comprehensive program of scholarships, fellowships, and professorships. Through this means we give worthy candidates help in advanced education and do what we can to keep teaching at a high level. The Foundation has now embarked on a five-year plan that will provide contributions to the regular operating expenses of colleges and universities.

Manufacturer's aids

In recent years we have helped several engineering schools to obtain A-C network calculating laboratories. In certain cases, the Foundation has provided graduate fellowships in power systems engineering. To keep teachers abreast with our research and development, we hold regular summer seminars for up to 40 engineering professors.

Of course, we have no way of directing a graduate who has benefited from one of our educational programs to join a utility company, although some of them do so. I am fully aware of the difficulties that confront the power company today in hiring graduate engineers. Electronics seem to offer more glamour and excitement than the utilities. Starting salaries in the utility field have been somewhat lower than in other electrical engineering fields. And finally, of course, there is the shortage of engineers at a time when competition for young engineers is fierce. One company is actually supposed to have approached a southern engineering school last June and put in a bid for (quote) "any of your graduate engineers that meet any of our requirements in any respect whatsoever."

Public relations needed

These difficulties are real, but in view of the vast expansion ahead and the new technologies in store for power, it should be possible to paint a career in the utility field that is every bit as glamorous as in electronics or any other. A long-range, well-planned public relations program would help. Some utilities have done a superb job in getting their story of low power costs and good service across to the general public. They can and must do as well in telling their story of engineering opportunity to the young engineers.

Your salary structure can be brought into line, not just starting salaries, but pretty much across the board. In fact, starting salaries are not always the deciding factor. Several professors have indicated that their engineering graduate is looking for a position where he can make a real contribution to his community and his country; and that he seeks recognition commensurate with his contribution.

Study provisions

If you will permit me to refer to my company once again, I will say that our own experience tends to confirm this. We have found in our recruiting programs that one of the strongest appeals we can make to graduates is the opportunity for professional growth.

One way to provide such opportunity lies in giving the young engineer ample opportunities for advanced education. We are now carrying on a graduate study program in cooperation with 20 universities. In addition to advanced engineering subjects, the program now includes liberal arts courses and the opportunity to work toward an advanced degree in business administration. The company in most cases pays the tuition.

The utilities could improve their appeal to graduates by offering programs such as this. The programs would be tailored to utility operations, but they would not have to be limited to engineering. As an engineer advances in his company, his responsibility usually reaches beyond the technical field. He will do a better job if he has been prepared for broadened assignments through courses which may include management, accounting, liberal arts subjects, and public speaking.

Providing opportunity

Next, it is essential that the engineer be given the opportunity to do work that challenges his knowledge and capabilities. See that his responsibilities grow at least as fast as his training program. There are few things more frustrating to an engineer than working on jobs that can be done with ease by supporting personnel, such as draftsmen and technicians. Too often, I have heard of young men who left the utilities because they were kept busy on sub-professional work.

Finally, there is need for a program to show the young engineer where his growth can be expected to lead him. To this end, we initiated some five years ago a comprehensive Management Development Program which applies to everyone in a supervisory position — about 7,000 persons.

In this program, every supervisory job carries a good definition. Each man's performance is periodically evaluated by a committee and this evaluation is then discussed fully with the individual. Criticism is constructive; suggestions for self-improvement have been enthusiastically received. The program includes an all-important step—implementation. This is designed to help the man strengthen himself in his present position or for promotion in the organization. Aggressive follow-through in this is essential to success of the whole program.

Among the steps we are taking are instruction courses in specific subjects; job rotation; public speaking courses; and self-training. We have an ever-enlarging number of men who take the courses in advanced management at Harvard, Pitt, Stanford, and elsewhere.

Three problems

In summarizing, let me say that I believe the utilities face three immense problems today and for the future.

The first is expansion at a rate demanded by a nation ever more hungry for power.

The second is developing the new technology needed for the generation, transmission and distribution of power.

The third is recruiting numbers of graduate engineers of high caliber sufficient to provide the top-notch engineering leadership you must have in the decades to come.

Of the three problems, the third is by far the most difficult and important. It is difficult because it means a major shift in utility policy and a marked change in the career decisions of engineers graduating today. It is important for on it hangs the success or failure of both your growth and your technology.

I am not here to tell you what to do. But, in recognition of this vital problem, I submit to you these ten questions for your serious consideration:

1. Is your salary structure competitive?

2. Have you a good orientation and training program to integrate the young engineer into your business and whet his imagination to

(*Continued on page 89*)

THE UTILITY ENGINEERS' FORUM

MITCHELL Lighting chosen

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With many years experience in the highly specialized field of school architecture, Mr. Schardt has numerous problems confronting him relative to the overall well-being of students, faculty and the community in general.

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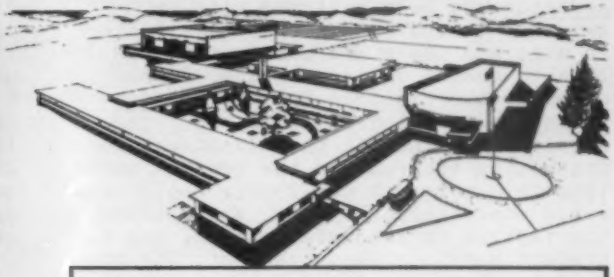

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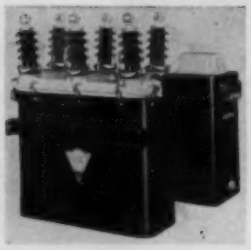
Notes on new utility equipment

A distribution valve type lightning arrestor has been designed with an external isolating line gap, available in nine and 10-kv maximum permissible line-to-ground voltage rating. Introduced by the Electric Service Manufacturing Co., Philadelphia 32, Pa., the arrester retains all the advantages in protection inherent in the crystal valve type arrester with non-linear resistance valve characteristics and, in addition, the feature of the external line gap to prevent possible line lock out. The protective characteristics are essentially the same as the present style crystal valve arresters without the isolating gap feature. This improvement is accomplished without additional length over that of present stud type arresters. This arrester is available with internal spark gap construction ventilated and non-ventilated.

A new type VR, heavy-duty, remote-control oil switch has been developed by the Line Material Co., Milwaukee 1, Wis. The VR switch has been designed for capacitor switching, distribution feeder sectionalizing, and automatic load transfer applications. It has a 110-kv BIL, a 20,000-ampere momentary rating, and a 400-ampere thermal rating. A VR switch trips and clears all three phases simultaneously in three cycles. An auxiliary switch that provides flexibility for relaying and signal schemes is available with the VR switch. Other accessories offered include signal arresters, 15-inch creepage bushings, a heating element, and a plug and receptacle connection.



Maxwell Equipment Co., Milford, Conn., exclusive national distributors of the Hydro Sky-Worker, have announced the development of an entirely new piece of aerial equipment known as the Tree King.

The company stated that the Tree King was developed at the request of industrial and utility operating executives intent upon securing an efficient low-cost aerial device.

Mounted on a conventional truck chassis, the unit enables a crewman at the controls to place himself at a comfortable working height of 45 feet from the ground. Horizontal working reach from the turret is 32 feet with a working load of 300 pounds.

Radical design changes provide a higher degree of maneuverability, greater height and longer reach than earlier company models. The lower boom, moving through an overhead arc of 135 degrees, 45 degrees past vertical, results in a material reduction of operating time in reaching areas above, between and behind utility lines.

An entirely new and extended series of line-type arresters, improved to provide 20 per cent lower discharge voltage and 10 per cent lower sparkover voltage than the preceding series, has been announced by the General Electric Company's Distribution Transformer Department, Pittsfield, Mass.

The range of the new series has been extended to include ratings from three through 121 kv.

Called Thyrite Magne-valve line-type arresters, the units employ the principle of magnetic action aiding valve action. This design of the equipment permits discharge of lightning or surge currents through the valve elements to ground and extinguishes power-follow current by the action of magnetic coils exerting an arc-quenching force in the arrester gap. This Magne-valve principle was introduced in the company's station-type arresters last year.

Complete, outdoor, packaged substations—from the incoming-line strain insulators to the outgoing low-voltage feeder terminals—are now being offered by the Line Material Co., Milwaukee 1, Wis. All components are co-ordinated to provide a standardized well-engineered package. Standard designs are available at any kva capacity.

L-M packaged substations include a newly designed galvanized steel structure that affords ease of installation, economy of steel, and versatility of application. Meeting all NEMA requirements, the structure is completely prefabricated and shipped disassembled for field erection. Erection, foundation, and anchor bolts, along with arrangement and erection drawings, accompany a disassembled structure. Chord members are punched at three-inch intervals along their length; a distinctive identifying hole is punched at one-foot intervals. Thus, field assembly of a structure can be achieved readily with maximum economy of labor and without special tools.

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... Unusual construction calls for aerially-installed cable with submarine-type insulation!

New York City's new 12-million-dollar Department of Marine and Aviation Pier 57 is one of the most modern in the world—and so is its wiring system.

A unique feature of the system is a cable with submarine-type insulation, installed aerially without physical protection of any kind. This installation offers most of the advantages of a conduit system at a far lower cost. The cable can withstand varying temperatures estimated from minus 10 degrees Fahrenheit to 130 degrees Fahrenheit and humidity up to 100%.

This cable was designed and tested to meet the special requirements of the Dept. of Marine and Aviation, City of New York, including U. S. Coast Guard specifications for submarine-type cable.

All of the wire and cable for the pier was supplied by Phelps Dodge.

On every wiring job, large or small, where top quality materials, expert workmanship and experienced "know-how" are called for, *it pays to rely on Phelps Dodge and your Phelps Dodge distributor!*

PHELPS DODGE COPPER PRODUCTS
CORPORATION

SALES OFFICES: Atlanta, Boston, Buffalo, Charlotte, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Fort Wayne, Greensboro, N. C., Houston, Jacksonville, Kansas City, Mo., Los Angeles, Milwaukee, Minneapolis, New Orleans, New York, Philadelphia, Pittsburgh, Portland, Ore., Richmond, Roanoke, San Francisco, St. Louis, Seattle, Washington, D. C.

CONCEALED

CONDUIT "IN CONCRETE SLAB" STORES

THINWALL

COND. SIZE	HRS. "C"	LABOR COST INSTALLED PER FT. AT FOLLOWING RATES										
		$1.25	$1.50	$1.75	$2.00	$2.25	$2.50	$2.75	$3.00	$3.25	$3.50	$3.75
1/2"	3.5	.0438	.0525	.0613	.07	.0788	.0875	.0963	.105	.1138	.1225	.1313
3/4"	3.8	.0475	.057	.0665	.076	.0855	.095	.1045	.114	.1235	.133	.1425
1"	4.3	.0538	.0645	.0753	.086	.0968	.1075	.1183	.129	.1398	.1505	.1613
1 1/4"	5.7	.0713	.0855	.0998	.114	.1283	.1425	.1568	.171	.1853	.1995	.2138
1 1/2"	7.1	.0888	.1065	.1243	.142	.1598	.1775	.1953	.213	.2308	.2485	.2663
2"	7.9	.0988	.1185	.1383	.158	.1778	.1975	.2173	.237	.2568	.2765	.2963

RIGID

1/2"	4.0	.05	.06	.07	.08	.09	.10	.11	.12	.13	.14	.15
3/4"	4.3	.0538	.0645	.0753	.086	.0968	.1075	.1183	.129	.1398	.1505	.1613
1"	4.9	.0613	.0735	.0858	.098	.1103	.1225	.1348	.147	.1593	.1715	.1838
1 1/4"	6.5	.0813	.0975	.1138	.13	.1463	.1625	.1788	.195	.2113	.2275	.2438
1 1/2"	8.1	.1013	.1215	.1418	.162	.1823	.2025	.2228	.243	.2633	.2835	.3038
2"	9.1	.1138	.1365	.1593	.182	.2048	.2275	.2503	.273	.2958	.3185	.3413

LABOR: INCLUDES INSTALLATION OF CONDUIT, CONNECTING TO BOXES AND TIES. (NO WIRE OR TAPS).

4-55

FIBER CONDUIT FITTINGS

OFFSETS IN CONCRETE (ADD AS REQUIRED)

COND. SIZE	HRS. EA.	LABOR COST EACH AT FOLLOWING RATES										
		$1.25	$1.50	$1.75	$2.00	$2.25	$2.50	$2.75	$3.00	$3.25	$3.50	$3.75
1"	.45	.56	.68	.79	.90	1.01	1.13	1.24	1.35	1.46	1.58	1.69
2"	.5	.63	.75	.88	1.00	1.13	1.25	1.38	1.50	1.63	1.75	1.88
3"	.6	.75	.90	1.05	1.20	1.35	1.50	1.65	1.80	1.95	2.10	2.25
4"	.75	.94	1.13	1.31	1.50	1.69	1.88	2.06	2.25	2.44	2.63	2.81
4 1/2"	.8	1.00	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80	3.00
5"	.9	1.13	1.35	1.58	1.80	2.03	2.25	2.48	2.70	2.93	3.15	3.38
6"	1.1	1.38	1.65	1.93	2.20	2.48	2.75	3.03	3.30	3.58	3.85	4.13
ST - F & R		ADAPTERS (TO STEEL) (ADD AS REQUIRED)										
1" to 2"	.35	.44	.53	.61	.70	.79	.88	.96	1.05	1.14	1.23	1.31
2" to 3"	.45	.56	.68	.79	.90	1.01	1.13	1.24	1.35	1.46	1.58	1.69
3" to 4"	.5	.63	.75	.88	1.00	1.13	1.25	1.38	1.50	1.63	1.75	1.88
4" to 4 1/2"	.55	.69	.83	.96	1.10	1.24	1.38	1.51	1.65	1.79	1.93	2.06
4 1/2" to 5"	.6	.75	.90	1.05	1.20	1.35	1.50	1.65	1.80	1.95	2.10	2.25
5" to 6"	.75	.94	1.13	1.31	1.50	1.69	1.88	2.06	2.25	2.44	2.63	2.81
		REDUCERS (ADD AS REQUIRED)										
1" to 2"	.35	.44	.53	.61	.70	.79	.88	.96	1.05	1.14	1.23	1.31
2" to 3"	.45	.56	.68	.79	.90	1.01	1.13	1.24	1.35	1.46	1.58	1.69
3" to 4"	.5	.63	.75	.88	1.00	1.13	1.25	1.38	1.50	1.63	1.75	1.88
4" to 4 1/2"	.65	.81	.98	1.14	1.30	1.46	1.63	1.79	1.95	2.11	2.28	2.44
4 1/2" to 5"	.75	.94	1.13	1.31	1.50	1.69	1.88	2.06	2.25	2.44	2.63	2.81
5" to 6"	.85	1.06	1.28	1.49	1.70	1.91	2.13	2.34	2.55	2.76	2.98	3.19

LABOR: INCLUDES INSTALLING ITEMS AS NOTED.

4-55

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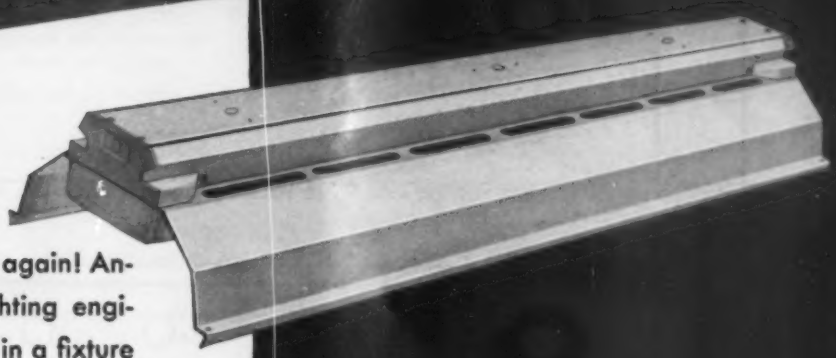
Wheeler "D" LINE

the "NEW LOOK" in INDUSTRIAL LIGHTING

New design features for better seeing.

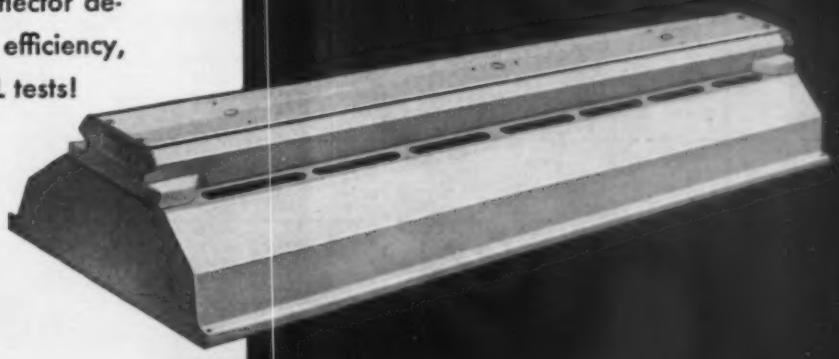


Wheeler does it again! Another advance in lighting engineering—interpreted in a fixture featuring typical Wheeler quality.

New Wheeler "D" Line fixtures provide more UPlight, approximately 12½% . . . greater protection for lampholders to minimize dirt and moisture problems . . . improved reflector design. Result — higher efficiency, actually proved by ETL tests!

PLUS

all the extra quality features that have distinguished Wheeler lighting fixtures since 1881.



Wheeler REFLECTOR COMPANY

Distributed Exclusively through Electrical Wholesalers

WHEELER

275 CONGRESS STREET, BOSTON 10, MASSACHUSETTS

now, you can SEE that wire joints

CONDUIT HOURS FOR STRAIGHT RUNS ONLY

FIBER CONDUIT IN TRENCHES
CONCRETE ENCASED

COND. SIZE	HRS. "C"	LABOR COST INSTALLED PER FT. OR EACH AT FOLLOWING RATES									
		$1.25	$1.50	$1.75	$2.00	$2.25	$2.50	$2.75	$3.00	$3.25	$3.50	$3.75
1"	3.9	.0488	.0585	.0683	.078	.0878	.0975	.1073	.117	.1268	.1365	.1463
2"	4.5	.0563	.0675	.0788	.09	.1013	.1125	.1238	.135	.1463	.1575	.1688
3"	5.2	.065	.078	.091	.104	.117	.13	.143	.156	.169	.182	.195
4"	6.0	.075	.09	.105	.12	.135	.15	.165	.18	.195	.21	.225
4 1/2"	6.9	.0863	.1035	.1208	.138	.1553	.1725	.1898	.207	.2243	.2415	.2588
5"	8.0	.10	.12	.14	.16	.18	.20	.22	.24	.26	.28	.30
6"	9.2	.115	.138	.161	.184	.207	.23	.253	.276	.299	.322	.345
SIZE RADIUS	HRS. EA	45 AND 90 DEGREE BENDS (ADD AS REQUIRED)										
1" - 18"	.3	.38	.45	.53	.60	.68	.75	.83	.90	.98	1.05	1.13
2" - 18"	.35	.44	.53	.61	.70	.79	.88	.96	1.05	1.14	1.23	1.31
3" - 24"	.4	.50	.60	.70	.80	.90	1.00	1.10	1.20	1.30	1.40	1.50
4" - 36"	.5	.63	.75	.88	1.00	1.13	1.25	1.38	1.50	1.63	1.75	1.88
4 1/2" - 36"	.55	.69	.83	.96	1.10	1.24	1.38	1.51	1.65	1.79	1.93	2.06
5" - 36"	.6	.75	.90	1.05	1.20	1.35	1.50	1.65	1.80	1.95	2.10	2.25
6" - 36"	.7	.88	1.05	1.23	1.40	1.58	1.75	1.93	2.10	2.28	2.45	2.63

LABOR: INCLUDES LAYING CONDUIT WITH STRAIGHT PTGS. (ADD FOR EXCAVATING, RE-ENFORCING, SPECIAL PTGS.)

4-55

NO CABLES PULLED - 3

LEAD SHEATHED CABLE (IN CONDUIT)
THREE CONDUCTOR

CONDR. SIZE	HRS."M" FT.	LABOR COST INSTALLED PER FT. AT FOLLOWING RATES										
		$1.25	$1.50	$1.75	$2.00	$2.25	$2.50	$2.75	$3.00	$3.25	$3.50	$3.75
10	11.5	.0144	.0173	.0201	.023	.0259	.0288	.0316	.0345	.0374	.0403	.0431
8	13.4	.0168	.0201	.0235	.0268	.03	.0335	.0369	.0402	.0436	.0469	.0503
6	18.9	.0236	.0284	.0331	.0378	.0425	.0473	.052	.0567	.0614	.0662	.0709
4	24.3	.0304	.0365	.0425	.0486	.0547	.0608	.0668	.0729	.079	.0851	.0911
2	34.5	.0431	.0518	.0604	.069	.0776	.0863	.0949	.1035	.1121	.1208	.1294
1	38.4	.048	.0576	.0672	.0768	.0864	.096	.1056	.1152	.1248	.1344	.144
1/0	45.1	.0564	.0677	.0789	.0902	.1015	.1128	.124	.1353	.1466	.1579	.1691
2/0	51.6	.0645	.0774	.0903	.1032	.1161	.129	.1419	.1548	.1677	.1806	.1935
3/0	58.2	.0728	.0873	.1019	.1164	.131	.1455	.16	.1746	.1892	.2037	.2183
4/0	68.5	.0856	.1028	.1199	.137	.1541	.1713	.1884	.2055	.2226	.2398	.2569
250 MCM	76.4	.0955	.1146	.1337	.1528	.1719	.191	.2101	.2292	.2483	.2674	.2865
300 "	86.6	.1083	.1299	.1516	.1732	.1949	.2165	.2382	.2598	.2815	.3031	.3248
350 "	95.0	.1188	.1425	.1663	.19	.2138	.2375	.2613	.285	.3088	.3325	.3563
400 "	104.0	.13	.156	.182	.208	.234	.26	.286	.312	.338	.364	.39
NO CABLES PULLED - 4												
10	12.7	.0159	.0191	.0222	.0254	.0286	.0318	.0349	.0381	.0413	.0445	.0476
8	14.7	.0184	.0221	.0257	.0294	.0331	.0368	.0404	.0441	.0478	.0515	.0551
6	20.8	.026	.0312	.0364	.0416	.0468	.052	.0572	.0624	.0676	.0728	.078
4	26.7	.0334	.04	.0467	.0534	.06	.0668	.0734	.0801	.0868	.0935	.10
2	38.0	.0475	.057	.0665	.076	.0855	.095	.1045	.114	.1235	.133	.1425
1	42.2	.0528	.0633	.0739	.0844	.095	.0155	.116	.1266	.1372	.1477	.1583
1/0	49.5	.0619	.0743	.0866	.099	.1114	.1238	.1361	.1485	.1609	.1733	.1856
2/0	56.6	.071	.0852	.0994	.1136	.1278	.142	.1562	.1704	.1846	.1988	.213
3/0	64.0	.08	.096	.112	.128	.144	.16	.176	.192	.208	.224	.24
4/0	75.4	.0943	.113	.132	.1508	.1697	.1885	.2074	.2262	.245	.2639	.2828

LABOR: INCLUDES PREPARATION, PULLING & LOSS TIME (NO TAPS) PULL WIRE IN PLACE, ADD FOR TRUCK OR WINCH RENTAL.

4-55

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Distributed Exclusively through Electrical Wholesalers

now, you can SEE that wire joints are properly installed . . .

one-piece, internally-serrated heavy-gauge bronze barrel tin-plated to resist corrosion — once staked on . . . stays on.

Catalog #PT60-M

tough, brightly-colored transparent insulating cap — screws on easily over body ears . . .

Catalog #PT6-M

you can see the job's done right

Catalog #PT66-M

the new T&B PT66-M Sta-Kon® wire joint

- brightly-colored transparent cap catches the eye . . . permits visual inspection of joint
- a better, permanent joint that won't relax its grip
- *smaller, neater* joints for crowded boxes and outlets
- a *better* electrical joint at lowest possible installed cost
- unique ear design locks parts together to prevent loosening of cap by vibration
- wide range—approved for solid or stranded conductor combinations up to 3 — #12 AWG Max.
- installs with standard Sta-Kon tools as well as new Sta-Kon *plus* Pliers

Catalog #WT161

To install — use T&B's new

STA-KON *PLUS* PLIERS

This new tool eliminates an extra tool to carry by combining a standard pair of electricians "side cutters" with a new-design, wide-range installing die for the PT66-M and other A, B, and C series Sta-Kon connectors (#22 to #10 AWG inclusive).

A top-quality tool, it is forged of carbon vanadium steel . . . has specially-shaped, blue plastic-cushioned handles for working comfort.

Get this special introductory kit at your electrical distributor

Catalog #PK2

Pat. Pending

1-Sta-Kon *plus* Pliers
100 PT66-M wire joints
in this attractive
and useful plastic box

only $6.90

LOOK FOR THIS SIGN —

T56

IT'S THE MARK OF AN AUTHORIZED T & B DISTRIBUTOR

The complete line of T&B fittings for conductors and raceways is sold only by recognized electrical wholesalers. It's our way of assuring you the service and savings of a friendly local source. Call him for all your electrical needs.

THE THOMAS & BETTS CO.

INCORPORATED

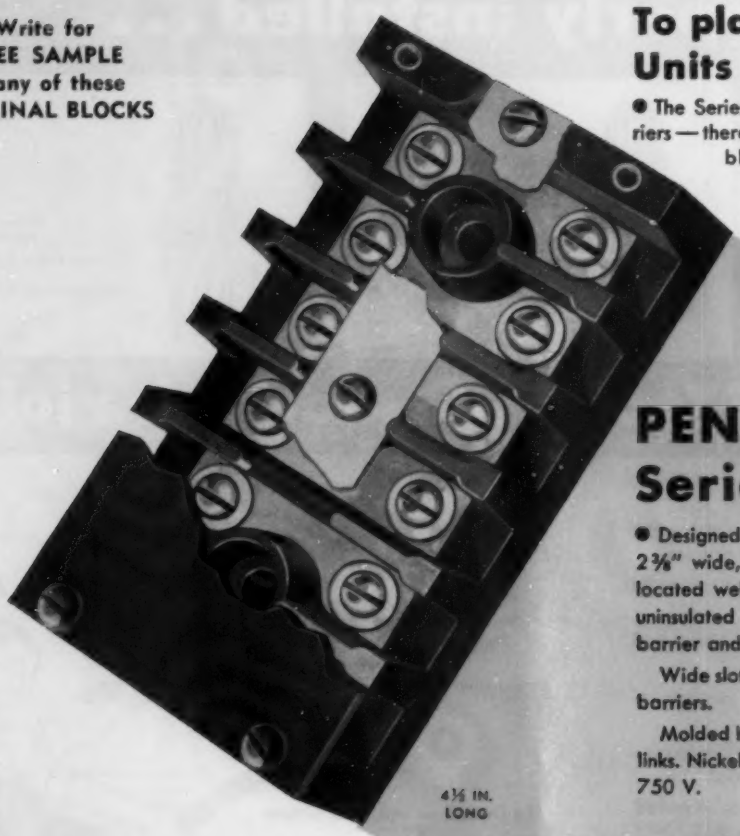
28 Butler Street • Elizabeth 1, New Jersey

Thomas & Betts Ltd., Montreal, P.Q., Canada

Write for
FREE SAMPLE
of any of these
TERMINAL BLOCKS

To place More Units *Lengthwise*

● The Series 1000 has no extra-width end barriers — there are no wide gaps between adjacent block connections, so more units go lengthwise in the space available.



4½ IN. LONG

PENN-UNION Series 1000

● Designed for space-economy lengthwise — but 2⅜" wide, permitting the binding screws to be located well away from the sides; less chance of uninsulated ends of wires projecting beyond the barrier and causing shorts.

Wide slot for making connections — ½" between barriers.

Molded black Bakelite base. Hard rolled copper links. Nickel-plated brass screws. Rating, 30 amp., 750 V.

Sold by leading wholesalers.
Warehouse stocks carried by—
L. MORRIS LANDERS CO.,
624 Spring St., N. W., Atlanta, Ga. and
201 W. Worthington Ave.,
Charlotte, N. C.

WALTER J. HUEMMER, Dallas Transfer & Term. Warehouse Bldg., Dallas, Texas
BEN K. PATTON, Gulf Sales Agency,
500 Magazine St., New Orleans, La.

3⅛ IN. LONG

Popular Block for Appliances— PENN-UNION Series 3300

● Widely used for Electric Dryers, Washing Machines, Ranges, etc. Substantially made, fully up to standard Penn-Union specifications 60 Amp., 250 V.

2½ IN. LONG

Small 4-wire for Appliances— PENN-UNION Series 5000

● A compact miniature of Series 1000, only ⅞-inch high and 1⅛-inch wide, rated 20 Amp., 500 V.

PENN-UNION Terminal

To place More Units *Sidewise*

● Nickel-plated brass screws and hard rolled copper links, standard on Penn-Union Terminal Blocks.

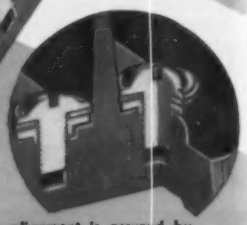
5½ IN. LONG

PENN-UNION Series 6000

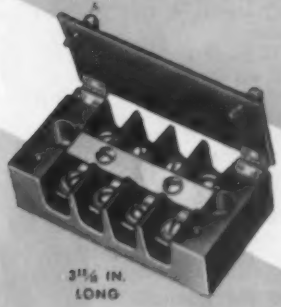
● Same wide slot as Series 1000, but 16% narrower—especially suitable when soldered or solderless lugs are to be used on the lead wires.

30 Amp., 750 V. The short-time current ratings can be increased by using additional jumper bars and longer screws.

Material specifications are same as Series 1000.



● Accurate alignment is assured by molding the brass inserts in the block, and tapping after molding.

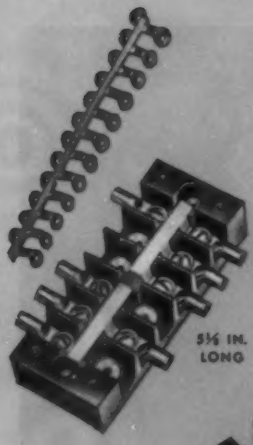


3¹¹⁄₁₆ IN. LONG

COVERS

● Bakelite or Asbestos — Hinged if desired.

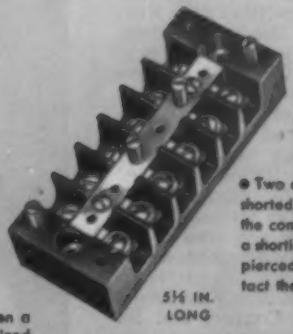
Holes are tapped at the corners of Penn-Union Series 6000 Blocks, for attaching a Bakelite or Ebony Asbestos cover, which can be furnished. 4 screws, or hinges with fastening knurled-head captive screws, or by spring clips for instant access.



5½ IN. LONG

Multiple Circuit Jumper Bars

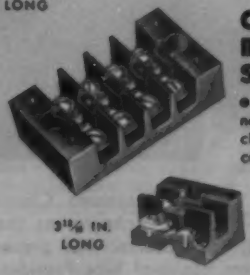
● To give any required branch circuits and tap-offs. Heavy rolled copper bar, in 12-circuit length, is cut to the circuits needed. At the right is shown one of the innumerable combinations that can be made.



5½ IN. LONG

Short Circuiting Series 6000—SC

● Two or more of the circuits can be shorted whenever desired. In place of the composition marking strip, there's a shorting strip of hard rolled copper, pierced to take shorting pins to contact the jumper bar.



3¹⁵⁄₁₆ IN. LONG

Circuit Breaking Series 6000—CB

● Very convenient when it's necessary to open and close circuits easily — for instance when a complex circuit must be sectionalized to locate trouble or make an adjustment.

The circuit-closing screws have machined shoulders—so that when in the open position they can't be turned and closed by vibration.

Blocks

PENN-UNION

Penn-Union Electric Corporation • Erie, Pa.

☐ *Send sheets showing full line of Terminal Blocks.*

☐ *Send new Pocket Catalog — complete Penn-Union line.*

Name_____

Company_____

News of the industry

edited for Southern readers

Baton Rouge Section of AIEE authorized

THE BOARD of Directors of the American Institute of Electrical Engineers has authorized formation of the Baton Rouge, La., Section of the Institute, bringing the total number of Sections to 107, the largest in the 71-year history of this technical society, N. S. Hibshman, secretary, has announced.

The new Louisiana Section, of which E. H. Coxe, power supervisor, Ethyl Corp., Baton Rouge, is chairman, and J. W. Elder, also of the Ethyl Corp., is secretary, formerly was a sub-section of the New Orleans Section.

NEMA offers fan sales plan book for retailers

A NEW PLAN BOOK for electric fan retailers—called Early Season Fan Selling Pays Off!—is now in process of distribution.

This pocket-size, 12-page booklet is a manual on early-season fan selling. Sponsored by the Electric Fan Section of NEMA, it starts by telling success stories of retailers who participated in the 1954 Electric Fan Window Display Contest.

The manual also describes a section in a special newspaper service being sponsored by the NEMA Electric Fan Section.

Another section of the manual illustrates and describes the winning windows in the 1954 contest. In '55, the Electric Fan Section is again offering $3,000 in U. S. Savings Bonds for prize-winning May window displays of fans.

The prizes offered and the rules of the contest are outlined, and there is a coupon that the retailer will send in for the industry window streamer—May Days Are Fan Days! — which is required to be used in the display windows being entered.

This "May Days Are Fan Days" Window Display Contest and its accompanying early-season fan promotion has become an annual event. Since it was established a few years ago, interest and participation have increased each year—and so has the electric fan business of the retailers participating.

The manual—Early Season Fan Selling Pays Off! — is being distributed through the sales organizations of member companies of the Electric Fan Section of the National Electrical Manufacturers Association and by NEMA headquarters. Special letterheads, bearing a reproduction of the 1955 window streamer are available to distributors and manufacturers at moderate cost, as are reprints of the special newspaper service, and the industry sales training manual "Facts About Fans". This material may be had by contacting member manufacturers, or the Electric Fan Section of NEMA direct, at 155 East 44th St., New York 17, N. Y.

AEC approves Seminole power reactor study

LEWIS L. STRAUSS, chairman of the Atomic Energy Commission, has announced the Commission has approved a proposal by the Seminole Electric Co-operative, Inc., of Madison, Fla., to study the feasibility of small central station nuclear power plants. The study will be performed under the AEC's Industrial Participation Program which has been underway since 1951.

Seminole is a federation of five electric distribution co-operatives in North Central Florida. The member co-operatives are financed by Rural Electrification Administration loans. The REA will observe and assist in the Seminole Study and will report to the REA borrowers on developments affecting the REA Program.

The object of the co-operative's study is to determine if a nuclear power plant can be developed to produce electricity at costs below those current in Florida and to determine the suitability of small plants with a 10,000 kilowatt capacity for use in the systems of member co-operatives. The study will run for one year and will be made at the expense of the co-operative.

The AEC will make available to the co-operative the reactor technology already developed and will provide consultation services of its personnel and of contractor personnel as required.

Seminole's member co-operatives serve one of the highest fuel-cost areas in the country. Its membrs are the Tri-County Electric Co-operative, Madison; Suwannee Valley Electric Co-operative, Live Oak; Central Florida Electric Co-

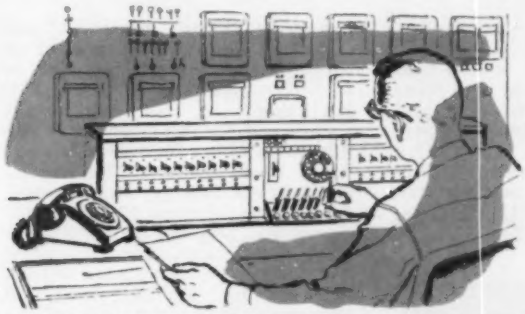
OKLAHOMA CHARTER—The Central Oklahoma Chapter of the Illuminating Engineering Society was granted a charter as the 69th Chapter of IES in Oklahoma City recently. The Charter was presented to Chairman Elmer Prag, right, by Southwestern Regional Vice-President M. J. Myers, Jr., left. John S. Williams, chairman of the Arkansas Chapter, presented a gavel to Mr. Prag. In addition to Mr. Prag, officers of the Central Oklahoma Chapter are, W. S. Irving, secretary-treasurer; and Paul R. Sheline, E. W. Leland, J. Dale Hampton, and Floyd Wilson, managers.

6 ways to save money in communications

If you want to save money and, at the same time, increase efficiency, let the Bell System furnish your communications. To get the facts, Bell System engineers will gladly make a joint review with your people. Ask your Bell telephone representative for more information.

BELL SYSTEM GIVES YOU COMMUNICATIONS AT LOW COST

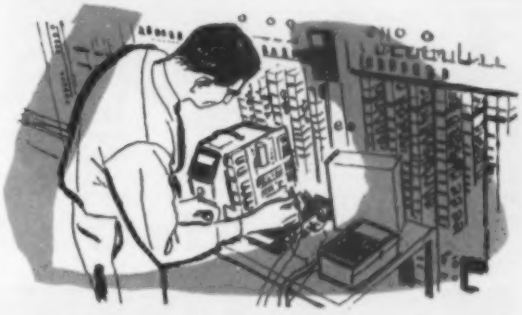
TAILORED COMMUNICATIONS—Bell System engineers fit your communications to your needs. You get precisely what you require. No more, no less.



FLEXIBLE COMMUNICATIONS—Designed to meet your exact requirements, Bell System communications may be expanded or rearranged to match the changing needs of your business.

NEWEST EQUIPMENT—The latest developments in communications equipment are available to keep your service at peak efficiency without investment of your capital.

ROUNDED EXPERIENCE—You benefit from years of Bell System experience with specialists in all phases of communications.



RELIABLE MAINTENANCE—You are relieved of repair and replacement worries. And Bell System preventive maintenance insures that your communications stay reliable.

YOUR MONEY is available to invest in revenue-producing projects, not tied up in communications equipment. A fixed monthly charge covers your exact needs.

BELL TELEPHONE SYSTEM

TELEPHONE MOBILE RADIO TELETYPEWRITER INTERCOMMUNICATION AND PAGING SYSTEMS TELEMETERING AND REMOTE CONTROL

operative, Chiefland; Sumter Electric Co-operative, Sumterville; and Withlacoochee River Electric Co-operative, Dade City.

The Fairbanks Morse Company is to be associated with Seminole during the period of this study. E. P. McLean Engineering Company has been employed by Seminole to co-ordinate and direct the study.

Name change announced for glass heat firm

THE SIX-YEAR-OLD Dixie Radiant Glass Heat Corp., Atlanta, Ga., has changed its name to DIXIE RAYdiant Electric Heat Corp., it has been announced by Kiliaen V. R. Townsend, president of the firm.

Mr. Townsend stated that since its organization the company has grown into the largest in the South devoted exclusively to the distribution of electric heating materials.

The company is now marketing under its own trade name DIXIE RAY, a complete line of electric glass heating panels, portables and thermostats as well as wire ceiling cable heat.

Home offices of the firm will remain at 66 Eleventh St., N. E., Atlanta, with branches in Birmingham and Mobile, Ala., Columbia, S. C., and Jackson, Miss.

The glass panels are being manufactured for DIXIE RAY at Marietta, Ga., in the plant of Damar, Inc., contract manufacturers of lighting fixtures and other electrical metal products.

The firm's cable for ceiling heat is being manufactured by Sunwarm, Inc., Kingsport, Tenn., and the thermostats by White-Rogers Electric Co., St. Louis, Mo.

At a recent sales meeting in Atlanta, A. L. Keane, Southeastern district manager of White-Rogers; Francis T. Walsh, president, and Louis B. Close, vice-president of Sunwarm, discussed features of their contributions to the DIXIE RAY line.

On hand for the meeting, in addition to Mr. Townsend, were A. R. Ross, Jackson, Miss., manager; Frank Mosley, Montgomery, Ala., dealer; Clauson Ely, Birmingham, Ala., Dixie Ray vice-president; Carl Hamburger, Columbia, S. C., manager, and James Wilson, manager for Mobile, Ala., and Pensacola, Fla.

REGIONAL MEETING—Another in a series of regional meetings held by Prescolite Manufacturing Corp., Berkeley, Calif., to introduce new Prescolite items to architects, electrical contractors, and the electrical trade was held recently in Shreveport, La. Shown above, seated, left to right, are Wallace D. Runswick, vice-president of Prescolite; Paul L. Osteen, Interstate Electric Co.; Paul O. Rottman, consulting engineer. Standing, Austin Little, Prescolite sales manager; John Hancock, Dallas, Texas; W. H. Massey, architect; E. H. Fleming, architect; and at the end of the table, E. C. Cordaro, president, Acme Electric Co.

Officials of the DIXIE RAYdiant Electric Heat Corp., Atlanta, Ga., are shown as they displayed one of their glass heat panels at a recent sales meeting. From left to right they are, Frank Mosley, Montgomery, Ala., dealer; Clauson Ely, Birmingham, Ala., company vice-president; Carl Hamburger, Columbia, S. C., manager; Kiliaen V. R. Townsend, Atlanta, president; and James Wilson, Mobile, Ala., and Pensacola, Fla., manager.

Seabrook re-elected head of Carolinas NECA chapter

JOHN G. SEABROOK of Charleston, S. C., was re-elected president of the Carolinas Chapter of the National Electrical Contractors Association at its annual business meeting at Charlotte, N. C., recently.

Other officers chosen to serve during the year are: W. C. McGregor, Greenville, S. C., re-elected vice-president; John C. Bolen, Charlotte, re-elected treasurer; W. W. Hanks, Charlotte, re-elected secretary; C. W. Moseley, Charlotte, District III, vice-president; Charles Thurber, Charlotte, District III regional director; and Ralph K. Robinson, Charlotte, re-elected as the chapter's member of the national board of governors.

Results of the election, conducted by mail balloting, were announced at the meeting, as was the election of the following as mem-

A clean, neat, easy-to-handle

Service Entrance Cable

No longer do sticky, hard-to-handle, unsightly service cables need to be your problem.

The new Rome Service Entrance Cable is easy to handle, neat, clean . . . and not subject to "bleeding" so prevalent with many service cables.

Rome SE *has four advantages to offer:*

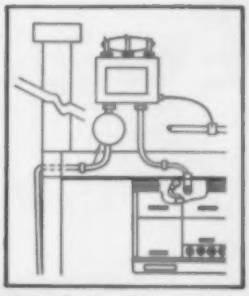
1. The outer glass-cotton braid is finished with compounds which give the cable a neat appearance . . . without sacrificing flame and moisture resistance. This finish has a neutral gray color that can be painted, if desired, to match the color of the building on which the cable is installed. It defies severe storage and service conditions without deteriorating and becoming sticky. The impregnation of the outer braid cannot bleed through this finish to make the cable unsightly.

2. The glass-cotton braid on each conductor—one red and one black—is clean, permanent, and provides easy conductor identification.

3. The insulation on each conductor is Underwriters' Laboratories approved as heat-resistant type RH for 75°C. . . . moisture-resistant type RW for 60°C.

4. The combination of a clean interior and a clean exterior construction provides a neat flexible cable that is easier to handle and makes a better looking installation.

Let us send you a sample of the new Rome Service Entrance Cable for your own examination. **Write today.**



Rome Service Entrance Cable can be used from service drop to meter and from meter to electric range or water heater. It can also be used as a single cable directly from pole to meter.

It Costs Less to Buy the Best

• **NEW 45-minute sound color film "CABLE—PATHWAY OF POWER" now available for showings to technical personnel.** For bookings, write to Rome Cable Corporation, Rome, N. Y.

ROME CABLE
Corporation
ROME • NEW YORK
and
TORRANCE • CALIFORNIA

bers of the board of directors: Ralph Presley, Asheville, N. C.; Joe Dunn, Columbia, S. C., L. G. Eakes, Charlotte; H. R. Pancoast, High Point, N. C.; Hector Ray, Fayetteville, N. C.; E. C. Peeler, Burlington, N. C.; G. W. Graves, Wilmington, N. C.; C. W. Moseley, Charlotte; and Marshall Walker, Rock Hill, S. C.

The group voted to seek higher standards of electrical installations, stating that state laws covering such installations only serve to protect the public against hazards to life and property and do not assure adequate installations to provide fullest possible and economic use of electricity.

FUNCTIONAL LIGHTING—New headquarters building of the National Hereford Association, in Kansas City, Mo., recently dedicated by President Eisenhower, is an outstanding example of functional lighting. Six-hundred Sunbeam Visionaires of various types were specified and installed in the executive and general offices, record and board rooms, cafeteria and other areas. All recessed fixtures were specially constructed to occupy a minimum recessed depth. These two and three-lamp, 96-inch, 430-milliamp units are equipped with double Fresnel type lens panels which help to direct the light in a uniform pattern at desk level.

Marvin Manufacturing opens Eastern plant

ANNOUNCEMENT of the opening of a new factory and warehouse with complete manufacturing facilities to serve the Eastern Seaboard has been made by Marvin Manufacturing Co. The new plant is located at 77-15 19th Rd., Jackson Heights 70, N. Y. Marvin manufactures recessed lighting and ventilating equipment.

The new facilities are housed in a modern, all brick, 15,000 square foot building. This unit comprises the third major location of Marco's manufacturing centers, established to serve the entire country.

With the New York, Chicago, and Los Angeles locations, Marco is now capable of supplying their more than 2,000 jobbers with immediate product delivery as well as "on the spot" technical and consultant services to aid in the solution of any lighting or ventilation problem.

The New York factory is under the personal supervision of Sam L. Beber, president of the company. John Sankewich has been appointed as district sales manager, and Sid Klores as sales engineer.

G-E cooling unit plant set for Tyler, Texas

GENERAL ELECTRIC has announced that it will build a new multi-million dollar plant in Tyler, Texas, for the manufacture of home cooling units.

Representing an investment of $15,000,000, when current and proposed plans are completed, the new G-E installation will be the company's first major manufacturing plant in the State of Texas and will constitute the 14th large facility to be established in the South by the company.

The first such facility was built at Jackson, Miss., in 1940.

Marvin Manufacturing has completed construction of this new New York plant to give them coast-to-coast coverage of the recessed lighting and ventilating equipment market. Marco also has plants in Chicago and Los Angeles. This plant covers some 15,000 square feet and is under the direct supervision of Sam L. Beber, president.

Annual convention held by Oklahoma Utilities

THE ANNUAL CONVENTION of the Oklahoma Utilities Association was held recently at the Mayo Hotel in Tulsa, according to an announcement by Kate A. Niblack, secretary of the group.

Featured speakers at the two-day meeting included Dr. William Shoupp, assistant manager, Atomic Power Division, Westinghouse Electric Corp., Pittsburgh, Pa.; Dwight W. Michener, economist, Chase National Bank, New York, N. Y.; J. W. McAfee, president, Union Electric Company of Missouri, St. Louis, Mo.; Tom Walker, president, Transcontinental Gas Pipe Line Corp., Houston, Texas; and J. C. Doyle, sales and advertising manager, Ford Motor Co., Dearborn, Mich.

Harry W. Pitzer, vice-president, Public Service Company of Oklahoma, Chickasha, is president of

FASCO VENTILATING FANS

No other inexpensive "Extra" gives such push to your new home sales!

Low-Cost Ventilation - Low-Cost Installation

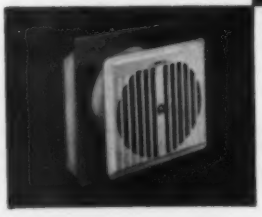
MODELS FOR EVERY NEED • NO SERVICE CALL BACKS FASCO offers a complete line of ventilating fans for every building need . . . in kitchen, bath and utility rooms...at prices to fit your building budget. All models guaranteed 5 years! Specify FASCO for *your* new homes.

MODELS 728-1021

For inside walls and ceilings. Turbo-Radial Impeller develops greater pressures. 728, 7" Impeller, 325 CFM; 1021, 10" Impeller, 530 CFM.

MODEL 880

For single story houses —in ceiling. Simple to install—low in cost—high efficiency. 8" blade, 475 CFM. Also model 1080, 10" blade.



MODELS 882-1082

Automatic wall ventilating fan Switch operated. 882, 8" blade, 375 CFM; 1082, 10" blade, 550 CFM.

MODELS 847–1047
OUTSIDE WALL VENTILATING FAN

A sturdy, efficient, low-cost fan for any home. Automatic pull-chain operation. For outside walls, 4¼" to 15" thick. 847, 8" blade, 475 CFM; 1047, 10" blade, 650 CFM.

Write Today for literature on the FASCO fan line.

ALL THE FEATURES BUILDERS WANT— DESIGNED WITH HOME BUYERS IN MIND

FASCO

FASCO INDUSTRIES, INC.
545 AUGUSTA STREET
ROCHESTER 2, N.Y.

the association; H. C. Webb, vice-president, Oklahoma Natural Gas Co., Tulsa, first vice-president; H. P. Hoheisel, second vice-president; and H. H. Ferrin, treasurer.

Atlanta firm established to handle stage lighting

JESSE C. Cox, formerly superintendent of the Tower Theater in Atlanta, Ga., has established his own business. Known as the Cox Stage Lighting Co., the firm has established offices at 166 Walton St., N. W., Atlanta, and set up warehouse facilities at nearby Chamblee, Ga.

The company will handle all kinds of lighting equipment and stage effects, including outdoor lighting. Mr. Cox, who is sole owner and operator, has been handling stage lighting for a number of years.

Pittsburgh Standard names three sales reps

ANNOUNCEMENT of the appointment of three new Southern sales representatives has been made by A. A. Snowball, vice-president in charge of sales, Pittsburgh Standard Conduit Co., Pittsburgh, Pa.

Southland Sales Agents, Memphis, Tenn., have been appointed Pittsburgh Standard representatives for Western Tennessee, including the Nashville area, and the State of Arkansas.

E. J. Hagan, New Orleans, La., will handle the Pittsburgh Standard line in the States of Louisiana and Mississippi, Southern Alabama (Mobile area) and Western Florida, including Pensacola.

Hopper & McCoy, Atlanta, Ga., have been appointed agents for the States of Florida, Georgia, Alabama, and Eastern Tennessee.

NEW FLORIDA REP—W. I. Crichton, left, is now representing the L. Morris Landers Co., Atlanta electrical manufacturers' agents in the State of Florida, exclusive of Pensacola, with headquarters at P. O. Box 173, Riverview, Fla. (near Tampa). L. Morris Landers, center, president of the Atlanta firm, and B. Allen Bryant, right, vice-president, go over the Landers lines with Mr. Crichton, who is a former district representative for G-E's Construction and Materials Division.

Executives of Pittsburgh Standard Conduit Co., Pittsburgh, Pa., are shown during their recent get-together with Southern representatives in Atlanta, Ga., following the SEWA Industry Day meeting. From left to right, seated, are F. C. Wiser, Robert G. McIlroy, president, and Alfred A. Snowball, vice-president in charge of sales, all of Pittsburgh Standard; standing, from left to right, W. E. Hopper, Sr., H. H. McCoy, and W. E. Hopper, Jr., of Hopper & McCoy, Atlanta; Paul Lumpkin, Paul Lumpkin Co., Charlotte, N. C.; Harold H. Bell, Hopper & McCoy; and E. J. Hagen, New Orleans, La.

LOOK presents trophies for best 'AW' programs

AT THE RECENT National Adequate Wiring Bureau's conference in Chicago, LOOK Magazine announced the four winners of its Community Service and Merchandising Achievement Awards for the Electrical Industry. Fred Bauer, vice-president in charge of LOOK's Chicago office, made the trophy presentations to the winners, who were picked — in their respective categories — for outstanding performance in alerting the public to the need for adequate electrical wiring.

Top honors for the LOOK Community Service Award in the utility field were shared by the Connecticut Light and Power Co., Berlin, Conn., and the Southwestern Public Service Co., Amarillo, Texas. The trophies were accepted by Charles Byron, residential sales manager of Connecticut Light & Power, and Tom Lynn, lighting specialist of Southwestern Public Service.

The LOOK Merchandising Achievement Award for electrical

Yes, we're Pittsburgh Standard Conduit's new Southern Sales Agents, and we have for you the two remarkable developments of the world's most modern conduit manufacturer . . . *color-coded* conduit to simplify your conduit storage and handling . . . and hot-dip galvanized conduit with *galvanized threads.*

Only Pittsburgh Standard offers conduit with the brightly colored thread protectors which tell their size story at an instant's glance. Only Pittsburgh Standard's extraordinary new Morrisville plant could have developed the exclusive process for galvanizing threads on hot-dip conduit. This is the process which ends expensive rusty-thread chasing.

Only Pittsburgh Standard offers these money savers . . and . . a complete line of Standard of the Trade products:

HOT-DIP GALVANIZED CONDUIT · ELECTRICAL METALLIC TUBING
ELECTRO-GALVANIZED CONDUIT · BLACK ENAMELED CONDUIT
ELBOWS · NIPPLES · COUPLINGS · FITTINGS

Thru the South . . .

. . . you'll find us ready to furnish you with quick service . . . and immediate bidding and delivery information from Pittsburgh Standard's unique Sales Control Center.

PITTSBURGH STANDARD CONDUIT CO.
50 years

E. J. HAGAN	HOPPER & MC COY, INC.	SOUTHLAND SALES AGENTS	PAUL LUMPKIN CO.
3820 Louisiana Ave.	454 Marietta St., N. W.	P. O. Box 165	222 Builders Bldg.
New Orleans, Louisiana	Atlanta, Georgia	Memphis, Tennessee	Charlotte, North Carolina
	Also offices in Tampa & Miami, Fla.	Also offices in Nashville, Tenn.	Also offices in Richmond, Va.

contractors went to the Butcher Electrical Service of Dallas, Texas. W. Ernest Butcher, owner, was on hand to receive the trophy.

The Merchandising Achievement Award for electrical distributors was won by the Oakes Electrical Supply Co., Holyoke, Mass., and the trophy was accepted by John M. Newton, president of the company.

In addition to the trophies, LOOK also presented a special scroll citation to the Cincinnati Gas & Electric Company for its role in the adequate wiring program. T. H. Bartindale, supervisor of sales promotion for Cincinnati Gas & Electric, accepted the scroll.

The competition was judged on the basis of the effectiveness of the merchandising and community service jobs done in alerting the public to the needs of adequate electrical wiring, using programs implemented by LOOK's "Watch Your Wiring" promotion. The first in a series of LOOK promotions planned for the electrical industry, this event was based on an editorial feature appearing in the November 22nd issue of LOOK Magazine, entitled "Watch Your Wiring."

Winners of LOOK Magazine's Community Service and Merchandising Awards for the Electrical Industry are shown at the recent National Adequate Wiring Bureau conference in Chicago. From left to right, they are, W. Ernest Butcher, Dallas; John M. Newton, Holyoke, Mass. Fred Bauer, LOOK's representative who presented the awards; T. H. Bartindale, Cincinnati; Tom Lynn and Charles Byron, both of Amarillo, Tex.

Bush named winner of lighting contest

WINNERS in the "My Most Interesting Lighting Job" contest were announced at the last regular meeting of the Georgia Section, Illuminating Engineering Society, and L. Ralph Bush, winner of first prize, will represent the section at the Southern Regional IES Conference to be held in Clearwater, Fla. Mr. Bush is a consulting engineer.

Second place in the contest was awarded Johnnie E. Sweatte, and third prize winner was Harry Yopp. Both men hold positions with Georgia Power Co.

Judges for the contest were Judd Lough, Holophane, Inc.; E. H. Smith, Robert and Company Associates, Atlanta; and J. T. Burt, Stevens and Wilkinson, Atlanta architects. T. Taylor Peake, Georgia Power Co., served as chairman of the contest.

Prior to the meeting, Study Club members heard an illustrated talk on "Lens Control," given by Judd Lough.

CHASE AGENT—Norman Wells, Jr., divisional sales manager of Chase & Sons, Inc., Randolph, Mass., left, and Ernest T. Loyd, Atlanta, Ga., manufacturers' agent, are shown at a recent get-together in Atlanta. Mr. Wells recently appointed the Ernest T. Loyd Company to represent the Chase line of electrical insulating tapes in Alabama, Georgia, Florida, Tennessee and North and South Carolina.

New Orleans contractors elect Emile B. Barris

EMILE B. BARRIS was elected president of the Association of Independent Electrical Contractors, New Orleans, La., at a recent meeting of the association.

Others elected to serve the group during the coming year included: R. E. Neumann, vice-president; Paul V. Smith, secretary; and Barney Oufnac, treasurer.

G-E Supply, Washington, holds new products show

A DISPLAY of new products, new methods and improvements in the supply and apparatus electrical field was held recently by the General Electric Supply Co., Washington, D. C., according to an announcement by B. W. Ruth, sales manager for supplies and apparatus for the branch.

Many interesting and informative exhibits were displayed with factory personnel present to demonstrate and explain the latest advances in their electrical products. Refreshments and a buffet supper

SORGEL AIR-COOLED Dry-Type TRANSFORMERS

Complete Line

¼ to 3000 Kva.

Single phase and poly-phase.

120, 240, 480, 600, 2400, 4160, 4800, 7200, 13,200, and up to 15,000 volts

for Every Purpose

To operate 120 volt lighting and portable equipment from 240, 480 or 600 volt power circuits, and higher distribution voltages.

To operate special equipment from standard circuits.

To change odd voltages to standard voltages and phase changing.

Also
Special Transformers, Saturable Reactors, AsKarel-cooled Transformers

¼ Kva single phase 480/240 to 240/120 volts

Also Sub-Stations and Power Centers

for indoor installations

Engineered to meet your exact requirements. Not necessary to design or change your installation to fit a "standard."

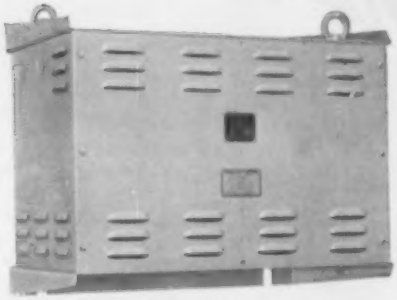
Any type of primary switch gear.

Metering—primary or secondary, to suit.

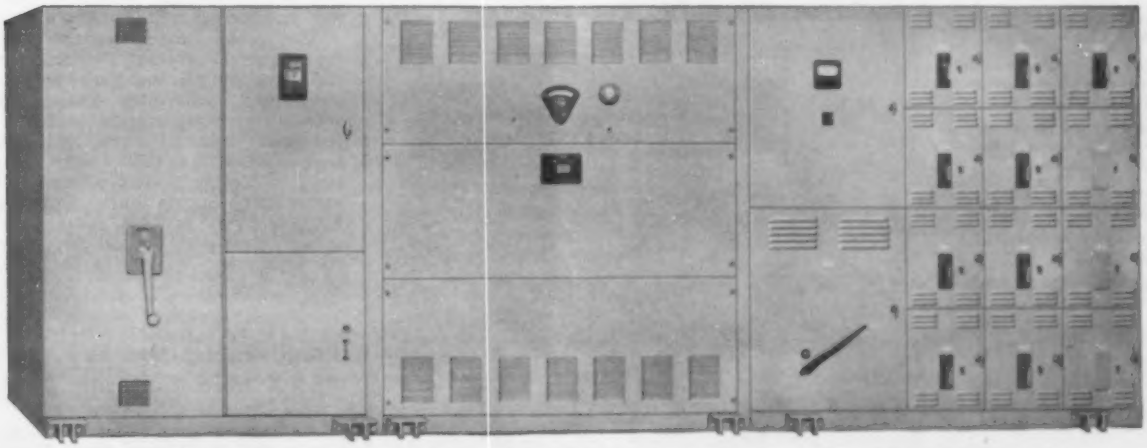
Secondary breakers, main, branch, or tie.

All incorporated with high quality, liberally designed **SORGEL Dry-Type or Askarel-cooled Transformers.** All factory assembled, wired and tested. **Mounted on a substantial steel base.** Shipped as a single unit or in sections, accurately co-ordinated for **easy assembly on the job.**

Sizes up to 3000 Kva. All voltages up to 15 KV.



20 to 50 Kva 3-phase. Wall mounting type.



Unit substation, with primary switchgear—metering—2000 Kva 3-phase, 13,200 volt transformer—secondary circuit protection. Shipped completely assembled, wired and tested, ready to connect to lines. Nothing else to buy, make, or assemble.

Sales Engineers in Principal Cities

SORGEL ELECTRIC CO., 835 West National Ave., Milwaukee 4, Wisconsin

40 years experience in the development, manufacturing, and application of Transformers

HUBBELL
REG. U.S. PAT. OFF.

NEW
SURFACE-TYPE
50 amp. POWER
OUTLET
WITH
METAL COVER

No. 7940
50 AMPERE (black face) featuring the new Hubbell Swivel-Nut Assembly.
(30 amp. also available, with screw terminals and L-shaped slot.)

It's Rugged

Designed to meet Underwriters' Laboratories requirements for metal cover, surface-type units, rugged enough to withstand rough usage in industrial or commercial applications.

UL

NEW SWING-TYPE CAPTIVE LOCKING UNIT SAVES WIRING TIME AND EFFORT

a. When screw is loosened, the Captive Locking Unit swings out of the way, providing an open channel for insertion of wire. This prevents loss of parts.

b. With wire in place, Captive Locking Unit is swung back into position.

c. Tightening the pressure screw provides positive contact.

FEATURES . . .

- Aluminum cover blends nicely with all kitchen interiors.
- Ribbed construction provides added strength and better appearance.
- Base protrudes slightly to line up with face surface, thus protecting the face.
- Phosphor-bronze springs insure strong grip for life of unit.
- Listed by Underwriters' Laboratories.
- Rugged, but light in weight.

Another HUBBELL Plus Feature . . .

Exclusive Captive Locking Unit — can't get lost. Saves endless wiring time — simplifies installation — many outstanding features. Write for new bulletin for complete information.

Highest Grade
HEAVY DUTY
WIRING HUBBELL DEVICES

FACTORY WAREHOUSE LOCATIONS ASSURE STOCK AVAILABILITY NATIONWIDE

37 So. Sangamon St. Chicago 7, Ill. | 103 No. Santa Fe Ave. Los Angeles 13, Calif. | 11-15 Park Place New York 7, N. Y. | 542 Natoma St. San Francisco, Calif.

HARVEY HUBBELL, INC., DEPT. R-2 Bridgeport, Connecticut

were served during the exhibit.

In addition to exhibit booths of the various department's of General Electric, other manufacturers, including Crouse - Hinds, Miller Company, Hubbard Company, Guth, Daybrite, Thomas & Betts, Edwards Company, Black & Decker, Curtis Company and Kirlin Company, were represented.

Porcelain appoints Florida sales agent

THE HIGH VOLTAGE Insulator Division of Porcelain Products, Inc., Parkersburg, W. Va., has announced the appointment of the John Carter Agency, 1112 Lakeshore Blvd., R.F.D. No. 1, Box 134, Lake Wales, Fla., as its new sales agent in the State of Florida and in Southern Georgia. The Georgia territory will include the counties

John Carter

of Clay, Calhoun, Dougherty, Worth, Turner, Ben Hill, Coffee, Jeff Davis, Appling, Wayne, Glynn, and the counties South of these.

The John Carter Agency will represent Porcelain Products in the sale of all its high voltage insulators, including suspension insulators, transmission and distribution clamps and fittings, transmission and distribution pin-type insulators, switch and bus or apparatus insulators, insulated clevises, wet process spools and wireholders and special porcelain the customer designs in this territory.

Lamb Enterprises buy Rasch Manufacturing

ANNOUNCEMENT was made recently that the assets of the Rasch Manufacturing Co., 50 - year - old manufacturer of water heaters, in Kansas City, Mo., has been acquired by Edward Lamb Enterprises, Inc., of Toledo, Ohio.

The Lamb organization also owns White Products Corp., Mid-

IT'S TRIANGLE

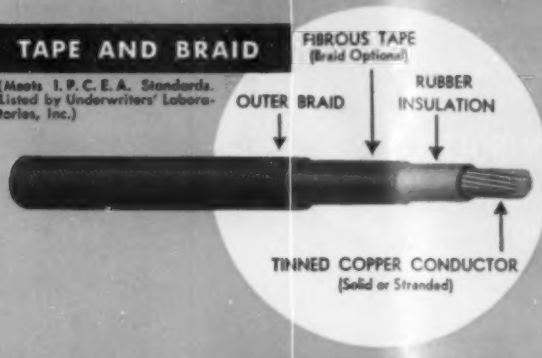
For Rugged, High Quality Power Cables—

All the Way Through!

Don't judge a power cable by its cover alone. If you want *reliability* in high voltage cables, check the complete construction of Triangle Power Cables. You'll find that every protective layer is made of quality materials that give you extra protection, *extra* benefits.

TAPE AND BRAID

(Meets I. P. C. E. A. Standards. Listed by Underwriters' Laboratories, Inc.)

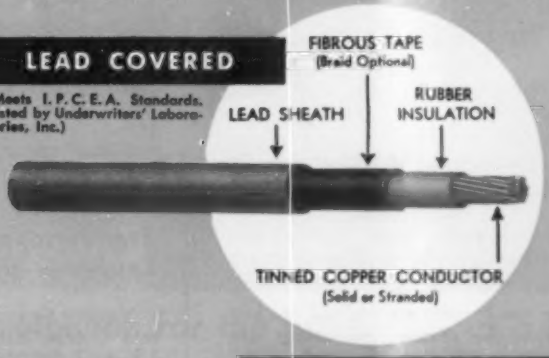


The braid covering on this Power Cable is made from high quality, long staple cotton or glass filament "GLAZON" braid or a combination of both, depending on the size. Underneath this tough braid is a layer of fibrous tape which is substantially as thick as the outer braid itself. This tape is a strong fabric, thoroughly impregnated with a rubber compound.

The insulation on these two cables is Triangle's famous "Adaptal" (Type RH-RW) insulation. This insulation is a high grade rubber, expertly vulcanized. Repeated tests prove that this insulation is far superior to normal insulation in its moisture resistance, heat resistance and long life. It is approved by Underwriters' for service either in wet locations at 60°C or dry locations at 75°C and exceeds Underwriters' specifications for either RH or RW.

LEAD COVERED

(Meets I. P. C. E. A. Standards. Listed by Underwriters' Laboratories, Inc.)



Where excessive moisture is expected to be encountered, specify Triangle Power Cable with the lead sheath. It affords extra protection against moisture, corrosion and mechanical damage.

OZONE RESISTANT

(Meets I. P. C. E. A. Standards. Listed by Underwriters' Laboratories, Inc.)

Here's the absolute tops in Power Cables. Where high voltages raise the possibility of destructive ozone, Triangle's "Triozone" cable is the answer.

Triozone insulation is a butyl-rubber base insulation that defies ozone and protects the outer neoprene cover.

In many cases a semi-conducting tape is applied over the stranded conductors for further protection.

A tough fabric tape is applied over the ozone-resistant insulation. When required, a tinned copper shield is applied. On top of this is more tape. Then—a special neoprene jacket that is resistant to oil, heat, sunlight, flame and corrosive chemicals.

OTHER POWER CABLES produced at Triangle include — Control Cable — V. C. Interlocked Armor Cable — Parkway Cable — Varnished Cambric — and many others.

It Must Be Right — The Trade Mark of TOP Quality — TRIANGLE ®

TRIANGLE CONDUIT & CABLE CO., INC.

NEW BRUNSWICK, N. J.

Manufacturers of Arteries for Electricity, Liquids and Gases

WIRE • CABLE • CONDUIT • PLASTIC PIPE • BRASS AND COPPER TUBE

The following is the Operating and Selling Policy of Arro Expansion Bolt Company, manufacturers of quality fastening and drilling devices for masonry — for over twenty-five years.

DISTRIBUTION—Arro products are sold nationally through qualified Wholesale Hardware, Industrial Supply, and Electrical Supply Distributors.

INQUIRIES—All inquiries are referred to our distributors in their respective territories.

PRICES—Arro products are reasonably priced to promote their broad use by consumers. Distributor mark-up on the Arro line insures an attractive profit.

RESALE—Arro distributors are urged to respect our suggested resale prices. Every lawful method is used to encourage this fair practice of merchandising.

STOCK—Arro offers its distributors a complete line of fastening and drilling devices for masonry. Distributors are expected to maintain a sufficient stock to adequately serve their trade.

SERVICE—Ten branch warehouse stocks are maintained in key cities, strategically located throughout the nation. All orders are shipped immediately from factory or branch warehouse stocks within 48 hours.

GUARANTEE—Arro products are fully guaranteed against defects in material and workmanship. Returned goods are accepted on authority of the Marion office only.

SALES AIDS—Arro helps promote sales for distributors by supplying a variety of sales literature, displays, and catalogs; by cooperating with their salesmen; and by regularly advertising in nine leading trade journals.

PARTICIPATION—Arro is an active member of leading industrial and trade associations.

This has been our Sales Policy since our birth in 1930. We believe that this policy, possible only under the American system of free enterprise, has been an important factor in our substantial growth and friendly relations with our distributors.

TRADE ARRO MARK

ARRO EXPANSION BOLT CO.

1520 Boone Ave., MARION, OHIO

dleville, Mich., and the firm states that the Rasch facilities will be used to expand both the White line of heaters and the "Security" line of heaters manufactured by Rasch.

The "Security" line of water heaters will be available in a glass-lined series, also, as well as its present production models.

Pettyjohn firm gets Roller-Smith line

APPOINTMENT of the John G. Pettyjohn Co., with offices located at 234 Daylight Building, Knoxville, Tenn., as their sales representatives for the State of Tennessee has been announced by Roller-Smith Corp., Bethlehem, Pa.

J. G. Pettyjohn **E. E. Rule**

Mr. Pettyjohn and his associate, E. E. Rule, will be responsible for the sale of the new Roller-Smith Uni-Bus busway low voltage distribution systems, switchgear, unit sub-stations, air and oil circuit breakers and isolated phase bus.

Preway appoints two Louisiana distributors

VALLEY SUPPLY CO., Gretna, La., and Collins Electric Co., Monroe, La., will distribute Preway Bilt-In appliances in Lousiana for Preway, Inc., Wisconsin Rapids, Wis., according to H. T. Anderson, sales manager for the appliance manufacturer.

Valley Supply will distribute Preway electric and gas Bilt-In ranges in a six-county area in the vicinity of New Orleans.

Collins Electric will cover the city of Monroe and the Northeast section of the state for Preway.

Griffin & Griffin get Haartz-Mason tape lines

APPOINTMENT of Griffin & Griffin, 931 W. Peachtree St., N. E., Atlanta, Ga., as their sales agents in the State of Georgia and Alabama has been announced by W. O. Sillen, assistant sales manager,

more protection for the public . . . at a new low cost to you

Hubbard's new Glo-Guard Guy Protector

● reflects brightly in headlight glare ● easily visible on dimly lighted streets or poorly lighted areas ● readily visible to pedestrians at night ● Cor-ten steel construction assures long life, high strength and light weight at a new low cost ● top quality double dip hot galvanizing assures superior resistance to atmospheric conditions

Protect the public from dangerous projections both day and night with Hubbard's new Glo-Guard Guy Protector, with the added feature of luminous areas that glow in the dark for additional visibility.

This new Hubbard guy protector is available in two lengths, 7 feet (Stock No. 718) and 8 feet (Stock No. 818), with attachment holes and clips designed for universal application to guy wires, rods or clumps. The clips and hole spacing allow the protector to be mounted close to the ground or at any height. Heads of attachment bolts are trapped so they will not turn as the nuts are tightened.

Hubbard Glo-Guard Guy Protectors are available for immediate delivery.

Your Hubbard representative will show you a model of this new Glo-Guard Guy Protector on his next call. If you want information immediately, please contact your nearest distributor or Hubbard and Company, 6301 Butler Street, Pittsburgh 1, Pa.

HUBBARD AND COMPANY

Pittsburgh 1, Pa.
Chicago 50, Ill.
Oakland 8, Cal.

FLASH!

A New Star on the utility horizon!

"Compresto® Cable"

The New Service Drop Wire and Cable with a Smooth Body and these added advantages:

It is —

Smaller, Lighter

Lower ice and wind loads

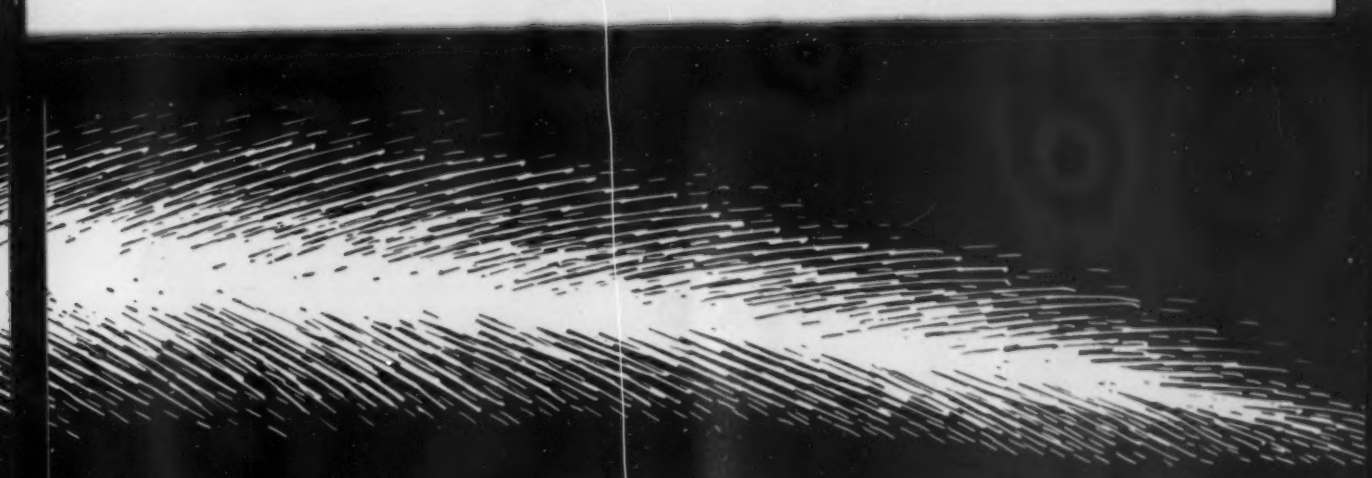
Retains flexibility of strand construction

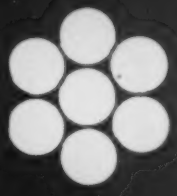
Greater surface contact for connectors

Reduced arcing and wire deformation

Without added cost

Covered with du Pont Neoprene, by Western Electric Company's Licensed improved "Room Temperature" process.





Compresto cable has the same metallic area and conductivity, and the same dielectric protection as ordinary cable

Manufactured under SOUTHERN ELECTRICAL CORPORATION'S Quality Control,

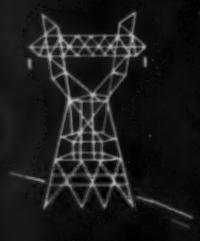
Neoprene - Covered "COMPRESTO CABLE"

Guarantees You The Ultimate In Resistance to —
Installation damage
Abrasion
Compression cutting
Weather
Corrosive Atmospheric conditions
Temperature changes
Aging

COMPRESTO CABLE is available on our no-charge, non-returnable reels, or in standard coils or packages to your specifications.

Look for the BLUE THREAD identification marker that assures you of Southern Electrical Corporation's superior "Quality Control" product.

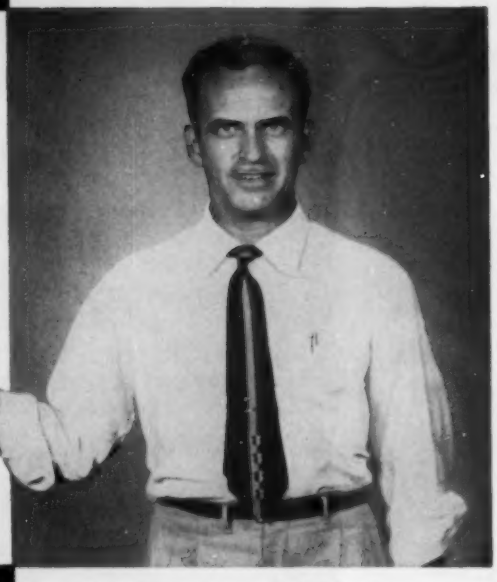
Applicable Fittings Are Available.



outhern lectrical orporation

CHATTANOOGA, TENNESSEE

"that's what I call a **GOOD** auxiliary gutter!



they're made in the right sizes with larger capacities... and they cost less to install!"

Say "cost conscious" Electrical Contractors all over the country.

ELBOW and TEE

"U" CONNECTOR

END CAPS

B-C SCREW COVER AUXILIARY GUTTERS

TYPE "SD" 4 x 4, 6 x 4 and 6 x 6
1 ft. through 5 ft. lengths

For Switches, Panel Boards or Straight Runs you can't match the flexibility, greater capacity and easy installation of B&C wireways. Die formed construction of heavy gauge sheet steel, as specified by the Underwriters Laboratories and the National Electrical Code.

Finished in hard light grey enamel . . . or galvanized when specified. All mounting screws furnished. Standard knockouts.

Write for complete catalog data, sizes and specifications.

UL B and C

METAL STAMPING CO.

Your Seals of Dependability and Safety

590 MEANS ST., N. W., ATLANTA, GA

Haartz-Mason, Inc., Watertown, Mass.

Griffin & Griffin will sell the Paramount Friction Tape, Stronghold Rubber Tape, and Paraplastic Electrical Tape lines, and are currently warehousing a complete stock of all lines.

Charleston contractor moves to new quarters

ANNOUNCEMENT has been made by Raymond R. Campbell and William J. Hennessy of the opening of new quarters for the American Electric Co., Inc., at 199 Calhoun St., Charleston, S. C.

Mr. Campbell and Mr. Hennessy are owners of the firm, which deals in commercial, industrial and residential wiring.

Pyle-National appoints Baltimore representative

WALKER & ROSCHE, manufacturers representatives in Baltimore, Md., have been appointed to handle the sales of the Pyle-National Company's industrial line of electrical equipment in that area, it was announced recently by C. H. Hobbs, vice-president.

Bryant offers booklet on planned home wiring

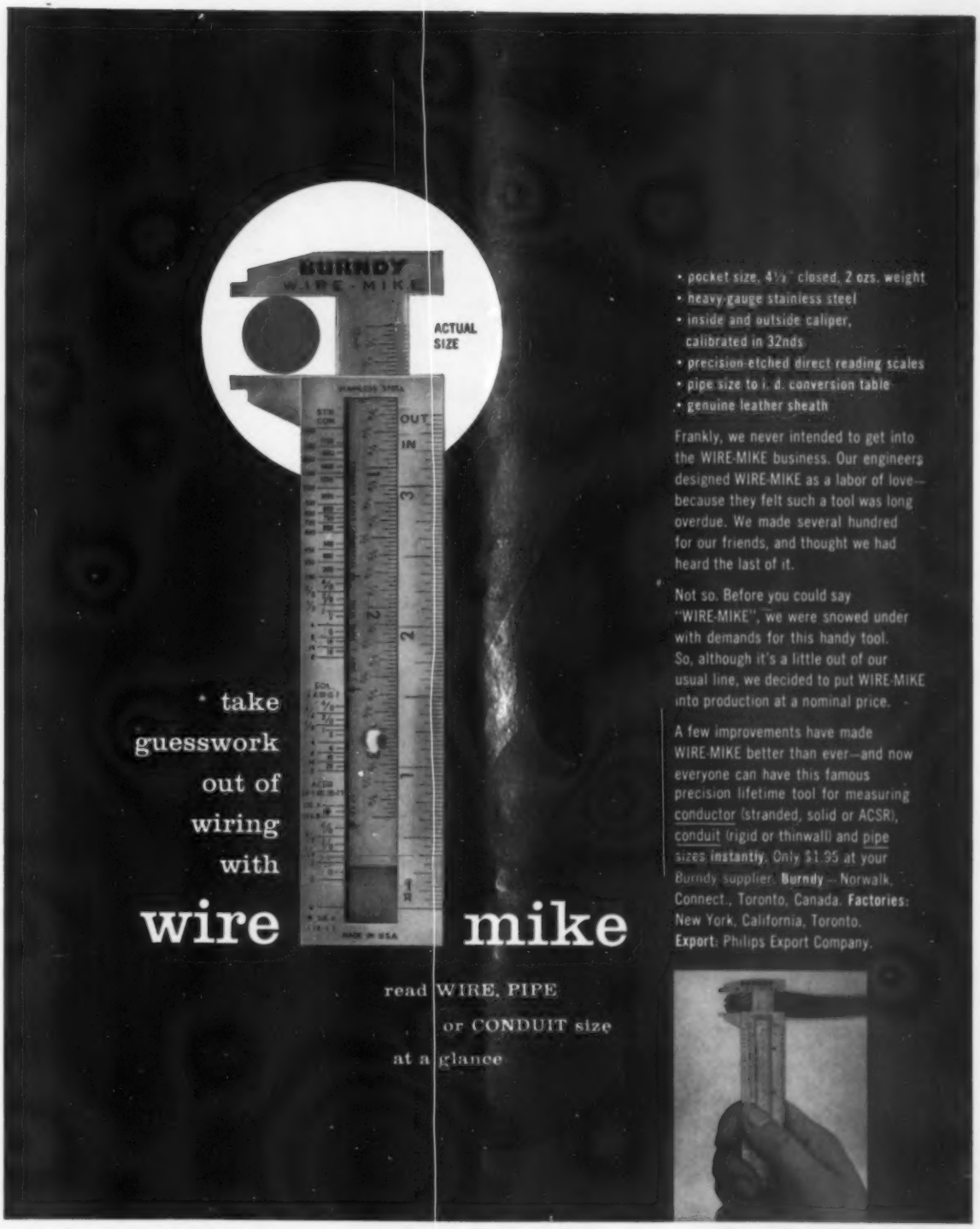
A NEW BOOKLET entitled "Bryant Guide to the All-Electric Home," which gives a prospective home builder helpful information in connection with a properly planned wiring system, has been published by the Bryant Electric Co., Box D, Barnum Station, Bridgeport 2, Conn.

The book stresses the use of quality materials, the importance of the architect, builder, electrical contractor and utility, and the economy of providing for future needs at the time of initial construction.

This booklet should prove very helpful to any individual or organization actively supporting adequate wiring programs. Copies of the Guide are available from Bryant at the nominal charge of ten cents per copy.

Fasco appoints Milner Southeastern sales agent

THE CONSUMER Goods Division of Fasco Industries, Inc., Rochester, N. Y., has appointed W. J. Milner and Co., 148 Walker St., S. W., Atlanta, Ga., as their sales representative throughout the States of


BURNDY
WIRE-MIKE
ACTUAL SIZE
OUT
IN
take guesswork out of wiring with
wire mike
read WIRE, PIPE or CONDUIT size at a glance
• pocket size, 4½" closed, 2 ozs. weight
• heavy-gauge stainless steel
• inside and outside caliper, calibrated in 32nds
• precision-etched direct reading scales
• pipe size to i. d. conversion table
• genuine leather sheath
Frankly, we never intended to get into the WIRE-MIKE business. Our engineers designed WIRE-MIKE as a labor of love—because they felt such a tool was long overdue. We made several hundred for our friends, and thought we had heard the last of it.
Not so. Before you could say "WIRE-MIKE", we were snowed under with demands for this handy tool. So, although it's a little out of our usual line, we decided to put WIRE-MIKE into production at a nominal price.
A few improvements have made WIRE-MIKE better than ever—and now everyone can have this famous precision lifetime tool for measuring conductor (stranded, solid or ACSR), conduit (rigid or thinwall) and pipe sizes instantly. Only $1.95 at your Burndy supplier. Burndy—Norwalk, Connect., Toronto, Canada. Factories: New York, California, Toronto. Export: Philips Export Company.
It's good business to connect with
BURNDY
54-13
... FIRST name in electrical connectors; tools; methods

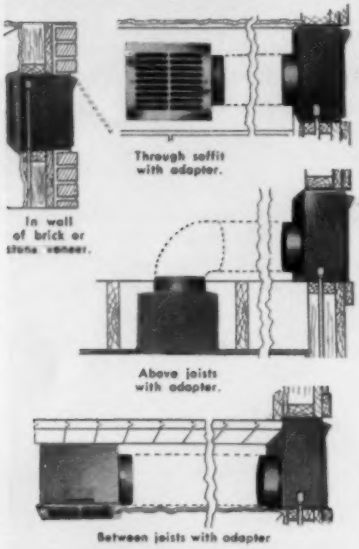
MARK OF A

***Quality* HOME**

***Broan* Motordor**

Kitchen Fan

Preferred by Architects, Builders, Electrical Contractors and Home-owners for fully automatic MOTORDOR operation by remote control, for the "FANTOM-GRIL" which conceals fan interior from view, and for adaptability to a wide variety of economical residential installations.



MOTORDOR Fan Obsoletes Ordinary Blow-type Fan

The MOTORDOR Fan in ceiling and soffit installations "pulls" rather than "blows" the air through the duct. With the fan at the outer end of duct, the kitchen is *free from fan noise.* There is no damper to rattle on windy days, for the motor-operated, insulated and weatherproof outer door, controlled by the same switch as the fan motor, provides positive protection against drafts.

Mail Coupon for 1955 Catalog

Every requirement in home ventilation is represented in the complete BROAN line of Wall and Ceiling fans . . . and also fan-type electric heaters.

BROAN MFG. CO., INC.
1671
Please mail a free copy of the 1955 Broan Exhaust Fan Catalog to

Name .....

Address .....

City ..... State .....

1671 N. Water St., Milwaukee 2, Wis

Alabama, Georgia, and Tennessee. The appointment was announced by Harry P. Toppin, president of Fasco.

Dates Ahead

American Institute of Electrical Engineers, Southern District Meeting, Soreno Hotel, St. Petersburg, Fla., April 13-15, 1955.

Alabama Chapter, IAEI, Annual Meeting, Thomas Jefferson Hotel, Birmingham, Ala., April 14-15, 1955.

Tennessee Chapter, IAEI, Annual Meeting, Andrew Jackson Hotel, Nashville, Tenn., April 18-19, 1955.

Petroleum Industry Electrical Association and **Petroleum Electrical Supply Association,** Joint Convention, Shamrock Hotel, Houston, Texas, April 20-22, 1955.

Florida Chapter, IAEI, Annual Meeting, Marion Hotel, Ocala, Fla., April 25-26, 1955.

Meter and Service Committee, EEI, Washington - Duke Hotel, Durham, N. C., April 25-27, 1955.

Protective Relay Engineers, Eighth Annual Conference, Department of Electrical Engineering, A. & M. College of Texas, College Station, Texas, April 25-27, 1955.

National Association of Lighting Maintenance Contractors, Annual Conference, Henry Grady Hotel, Atlanta, Ga., April 25-27, 1955.

South Carolina Chapter, IAEI, Annual Meeting, Hotel Columbia, Columbia, S. C., May 3-4, 1955.

Joint Chapter Meeting, IAEI, Blackstone Hotel, Tyler, Texas, May 6-7, 1955. Joint annual meeting of the following chapters: George Welman (La.); North Louisiana-East Texas; Texas; and Texas Gulf Coast.

American Institute of Electrical Engineers, Electric Heating Conference, LaSalle Hotel, Chicago, May 10-11, 1955.

North Carolina Chapter, IAEI, Annual Meeting, Carolina Hotel, Raleigh, N. C., May 10-11, 1955.

District 5, NECA, joint meeting with IBEW, Texas Hotel, Fort Worth, Texas, May 9-12, 1955.

Electrical Equipment Committee, EEI, Rice Hotel, Houston, Texas, May 16-17, 1955.

National Association of Electrical Distributors, 47th Annual Convention, Conrad Hilton Hotel, Chicago, Ill., May 22-25, 1955.

District 3, NECA, Annual Meeting, George Washington Hotel, Jacksonville, Fla., June 2-3, 1955.

National Industrial Service Association, 22nd annual convention of the national association of motor repair shops, Hotel Statler, Los Angeles, Calif., June 6-10, 1955.

Edison Electric Institute, Annual Convention, Los Angeles, Calif., June 13-16, 1955.

American Institute of Electrical Engineers, Summer General Meeting, New Ocean House, Swampscott, Mass., June 27-July 1, 1955.

Southeastern Electric Exchange, Personnel Administration Section, Roanoke Hotel, Roanoke, Va., Aug. 11-12, 1955.

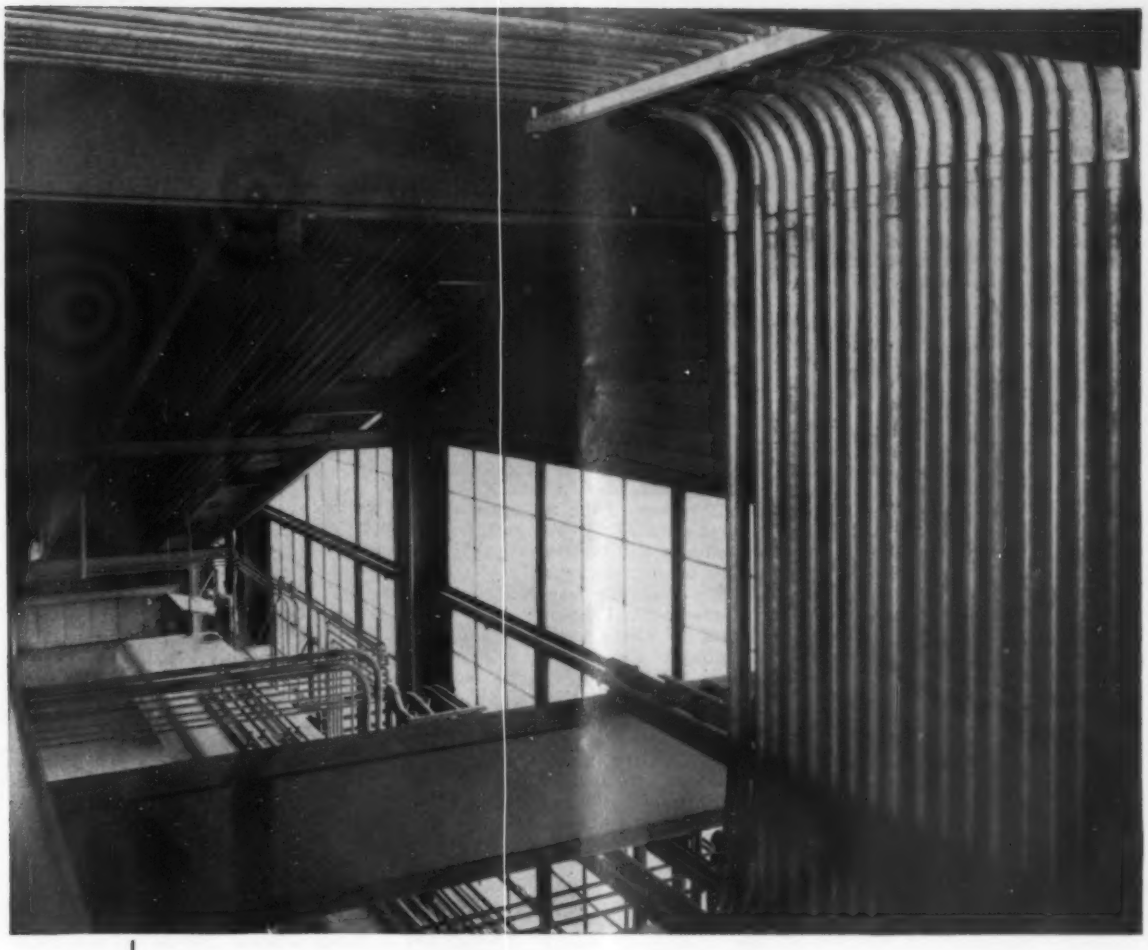
Southeastern Electric Exchange, Engineering and Operation Section, Charlotte Hotel, Charlotte, N. C., Sept. 22-23, 1955.

American Institute of Electrical Engineers, Fall General Meeting, Morrison Hotel, Chicago, Ill., Oct. 3-7, 1955.

Southern Section, IAEI, Annual Meeting, Jung Hotel, New Orleans, La., Oct. 3-5, 1955.

Southeastern Electric Exchange, Accounting Conference, Hotel San Carlos, Pensacola, Fla., Oct. 20-21, 1955.

Southeastern Electric Exchange, Sales Conference, Biltmore Hotel, Atlanta, Ga., Oct. 27-28, 1955.



WHY *contractors* **LIKE YOUNGSTOWN CONDUIT**

• They know it's easy to bend. Easy to thread. Easy to handle and install, especially in cramped or small spaces. And its smooth, inside finish speeds up wire-pulling and results in easier, faster installations.

Wiring in Youngstown rigid steel conduit is safe. It gives protection against damage from moisture, vibration, dust, dirt and crushing. The job is safe. And so is your reputation.

On your next job, don't take chances. Be sure there's no waste. Make sure you get the savings you should, all down the line. Ask your distributor for Youngstown Buckeye Conduit. Approved by the National Electrical Code for all hazardous locations. Buckeye electrical conduit is produced from ore to finished product by one manufacturer — Youngstown.

THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yoloy Steel

GENERAL OFFICES: YOUNGSTOWN 1, OHIO
DISTRICT OFFICES IN PRINCIPAL CITIES

News about people

Leo L. Hirsch, president of **Electrical Supply Co.,** New Orleans, La., recently announced several new appointments.

H. F. Schmidt has been named general manager of the company. Mr. Schmidt has been with Electrical Supply since 1916, and a member of the board of directors since 1930. He has successively held the positions of assistant secretary and secretary - treasurer since 1930.

Harold Melville, newly appointed assistant general manager of Electrical Supply, joined the company in 1912. He has worked in the stock, accounting, purchasing and pricing departments and, prior to his promotion, was assistant sales manager since 1940.

James Frank, Jr., has been named merchandise manager of the company. Mr. Frank, who recently joined the company, was formerly connected with the Radio Corporation of America, Camden, N. J.; General Precision Equipment Corp., New York City; and the National Production Authority, Washington, D. C.

James F. Mulla, new city sales manager of Electrical Supply, started with the company in 1916 in the Stock Department and later moved into the City Sales Department. Mr. Mulla has been a salesman for the Company for over 25 years.

Ben Katz, Electrical Supply Company's new division sales manager, started with the company in 1924 in the Stock Department and was later in the City Sales Department. Mr. Katz has been a salesman for the company for 29 years.

Richard C. Waldron has been appointed manager of engineering of the **Okonite Co.,** Passaic, N. J., and will supervise the activities of the Engineering Department. **Edward E. McIlveen** will become assistant manager of engineering.

Mr. Waldron was named senior engineer in 1954, prior to which time he was assistant to the chief engineer. He has been associated with Okonite since 1928 and has been engaged in the development and application of all types of electrical cables.

Mr. McIlveen, previously cable engineer, came to Okonite in 1941, before which time he had been associated with the ocean cable engineer's office of the Western Union Telegraph Co. He has been engaged in research and development work and in 1954 joined the Engineering Department.

This is the new executive line-up for Electrical Supply Co., New Orleans, La. Seated, from left to right, are H. F. Schmidt, general manager, and Harold Melville, newly appointed assistant general manager. Standing, from left to right, are Ben Katz, division sales manager; James Frank, Jr., merchandise manager; and James Mulla, new city sales manager.

Hal P. Beard, 800 Barry Rd., Memphis, Tenn., has recently been appointed district manager for **Electro Silv-A-King Corp.,** Chicago, Ill., designers and manufacturers of commercial and industrial lighting fixtures. He will contact architects, contractors, engineers, utilities and

Hal P. Beard

electrical distributors in the territory of Arkansas, Western Tennessee (West of Nashville) and North and Central Mississippi (including Jackson).

Mr. Beard has just formed his own Agency, and previously was lighting and lamp specialist for General Electric Supply Co., Memphis. He received his degree in Electrical Engineering from Mississippi State College. He also participated in the G-E test engineering program.

The appointment of **George V. Sheppard, Jr.,** and **James W. Brooks, Jr.,** as district representatives for **General Electric's Construction Materials Division** has been announced by **Ralph C. Dean,** the division's manager of sales operations.

Mr. Sheppard, who will handle the division's full line, has been assigned to Charlotte, N. C., and will have his offices at 1300 Berryhill.

Curtis Lighting, Inc., Chicago, Ill., has announced the retirement of **G. T. Morrow,** vice-president in charge of sales.

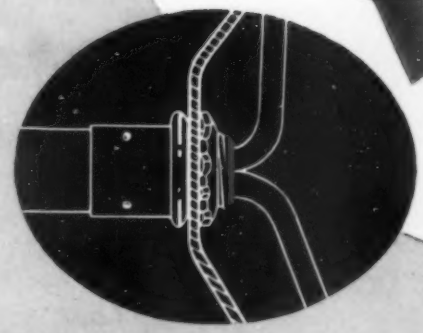
Mr. Morrow began his career with Curtis Lighting in 1922, as a resident engineer at Pittsburgh, Pa. In 1929, he came to Chicago, where he held various positions in the sales department. In 1940, he was made vice-president in charge of sales and a member of the board of directors. During World War II, he served as acting general manager.

Mr. and Mrs. Morrow will make their home in Coral Gables, Fla.

Red Throat

B-M 21 B, THE NEW INSULATED THROAT INDENTER CONNECTOR FOR E. M. T.

Four Ways Finer



1. Protruding rounded red plastic lip of bushing prevents cutting of insulation—eliminates shorts.
2. Full thread screws into all conduit fittings. Lip of RED THROAT bushing protects thread from damage.
3. Deep dished eight pronged lock nut is easier to drive on—screws flush to shoulder and digs into metal of box for vibration proof positive ground.
4. Permanent locked-in bushing insures smooth burr-free raceway for easy fishing. No extra work and costs no more.

Briegel, the Original Indenter Fittings are neater in appearance, easier and faster to use. Installation is simple and less expensive. Two quick squeezes sets them forever. Try B-M Indenter Fittings and get more profits from each job!

ALL BRIEGEL FITTINGS ARE U. L. APPROVED AS CONCRETE-TIGHT

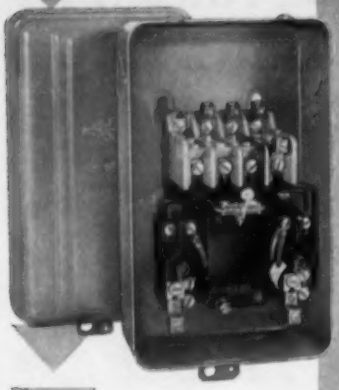
Order from Your Wholesaler!

All B-M Indenter Fittings are U.L. Approved as concrete-tight and for general use (File Card E10863). Also comply With Federal Specifications W-F-406.

BRIEGEL METHOD TOOL CO.
GALVA • ILLINOIS

Warehouse Stocks in Principal Cities for Immediate Delivery!

Save 3 WAYS



COST!

Save up to 25%. With the wide range of Furnas Electric starters to choose from, you don't have to waste money on starters too big for the job.

CAPACITY!

The many in-between sizes in the Furnas Electric line allow you to choose the control that is best suited for your particular job.

SPACE!

You can save up to 40%. By selecting the exact size starter for your requirements you get a starter that is more compact.

Write Today for free 140-page Catalog 101. Furnas Electric Company, 1064 McKee Street, Batavia, Illinois

FURNAS ELECTRIC COMPANY

BATAVIA, ILLINOIS

Sales Representatives in all Principal Cities

John T. Shewmake has been elected president of **Southwestern Electric Service Co.**, and **Carl S. Makeig**, who has been president since the organization of the utility in 1945, was named chairman of the board,

J. T. Shewmake

it was announced recently following a regular meeting of the board of directors held in Dallas.

Mr. Shewmake, a vice-president of Southwestern for the past seven years, has been active in the electric utility business for over 30 years. He is a native of Georgia and, following his graduation from Georgia Tech in 1923, began his business career with Stone & Webster, Inc., in Boston. Subsequently, he served in various positions with electric utility companies in Seattle, Jamaica, B. W. I., El Paso, Galveston and Lubbock, Texas.

Mr. Makeig has taken a prominent part in the development of the electric industry in the Southwest for many years. As a young man, he began his career in the electric offices at Cleburne, Texas, later moving to Waco where he worked in the public utility offices there. In 1916, he moved to Amarillo to begin a period of 38 consecutive years with present and predecessor companies. In 1919 he became secretary of the utility and was named manager in 1925. From 1927 to 1930, Mr. Makeig served in managerial duties with affiliated companies in New Mexico and Louisiana, returning to Amarillo in 1930 as general manager of Southwestern Public Service Co. In 1934, he was elected president, the position he relinquished in 1945 to become president and director of the newly organized Southwestern Electric Service Co.

G. A. Peer, who formerly owned and operated the Wetherbee Electric Co., is now associated with **McEldowney and Son, Inc.**, Oklahoma City, Okla., according to a recent announcement by **John W. Shawver.**

L. M. Smith, president of the **Alabama Power Co.**, was named as Birmingham's Man of the Year for 1954 at a recent dinner meeting in Birmingham. He was chosen from a group of 21 nominees for the honor awarded each year by the Young Men's Business Club of Birmingham.

Mr. Smith was named by William P. Engel, who in listing his numerous activities and accomplishments said of him, "He is a man who has overpaid his civic rent."

MALLEABLE APPOINTMENTS — Ogden W. Sutro, left, has been advanced from sales manager, Pole Hardware Division of Malleable Iron Fittings Co., Branford, Conn., to assistant to the president, T. F. Hammer. Albert B. Stevens, right, formerly assistant sales manager, has been named sales manager of the Pole Hardware Division.

Edward L. O'Neill has been elected vice-president and general sales manager of the **Emerson Electric Manufacturing Co.**, St. Louis, it was announced recently by **W. R. Persons**, Emerson president. Several other elections and appointments and one retirement also were announced.

As general sales manager, Mr. O'Neill will direct Emerson's sales, sales promotions, advertising and public relations. He had been assistant to the president since joining the company last July. He was export manager and assistant to the president for Trailmobile, Inc., in New York City before coming to Emerson.

Others to assume new duties are:

R. E. Otto, elected vice-president, motors. Mr. Otto, who has been with Emerson since 1914, will serve in executive liaison and as consultant on sales policy.

Gilbert F. Craig, appointed assistant vice-president, industrial relations. With Emerson since 1949, Mr. Craig will be responsible for the company's personnel program.

William L. Davis, Jr., appointed assistant vice-president, engineering. He will be responsible for armament engineering. He has been with the company since 1942.

The retirement announced by Mr. Persons was that of **John A. Driy**, who retired from active service as executive vice-president on December 31, 1954. Mr. Driy had held the position since May, 1953.

Driy, who came to Emerson in 1914, became chief mechanical engineer in 1920, was promoted successively to assistant superintendent, factory superintendent and factory manager. He was elected vice-president in charge of operations in 1942 and later as a member of the board of directors.

Also announced were the re-election of **W. S. Snead**, chairman of the board of directors; **W. R. Persons**, president; **R. E. Petering**, vice-president and treasurer; **H. C. Miller**, vice-president in charge of operations; **R. H. McRoberts**, secretary, and **B. W. Jackson**, comptroller and assistant secretary.

SALES AWARDS—Sales award winners for 1954 were recently announced by Buchanan Electrical Products Corp., Hillside, N. J., at their annual sales meeting. Award winners in the category of Sales versus Quota in national competition went to Belcher & Associates, Inc., Buchanan representatives who make their sales headquarters in Jacksonville, Fla., and cover the States of Georgia, Alabama and Florida. Left to right are Ed Getsee, Miami; Jack Belcher, Jacksonville; and Carl Smith, Birmingham.

Richard H. Osgood, Sr., has resigned as president of the Gearhart Co., Atlanta, Ga., to form **Osgood Associates**, who will be sales consultants and manufacturers representatives with headquarters in Atlanta and will maintain a branch office in the Jacksonville, Fla., area.

R. H. Osgood, Sr.

GEORGIA IES OFFICERS—Glenn E. Park, center, G-E's district manager for the Carolinas and Southern Regional vice-president of the Illuminating Engineering Society, recently addressed the Georgia Section in Atlanta. Others in the picture, all officers of the Georgia Section, are, from left to right, front row, J. Dixon Mitchell, examining board; Mr. Park; and Judd Lough, vice-chairman of the Georgia Section. Back row, left to right, W. M. Pearson, J. D. Poage, J. E. Sweatte, and R. E. Lawler, members of the board of managers. (Photo by Tom Haslam.)

Anaconda Wire & Cable Company has announced the appointment of **H. E. West** as contractor sales manager. For a number of years, Mr. West served as Southern regional manager and more recently has been with the company in Washington, D. C.

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EXTRA FEATURES

in fine FANNER

Superformed ARMOR RODS

Their VERSATILITY means ECONOMY plus these ADVANTAGES (and more):

1. Conductor protection against harmful effects of vibration.
2. Ends chafing and pitting of conductor by loose line components.
3. Elimination of damage to conductor in case of power arcs.
4. Conductor strength and conductance restored where damaged.
5. Benefits from smaller and closer fitting clamps.
6. Complete reusability — time after time.
7. Permanent "self-clamping" action for life of the application.
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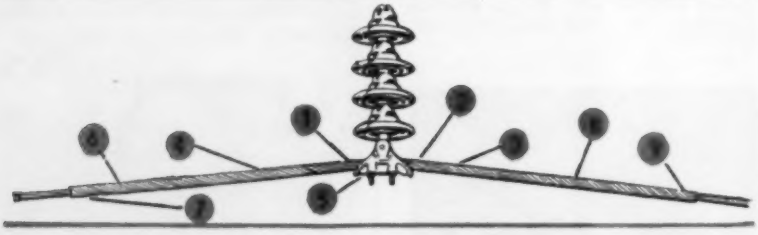
9. Conductance of armor comparable to that of conductor.



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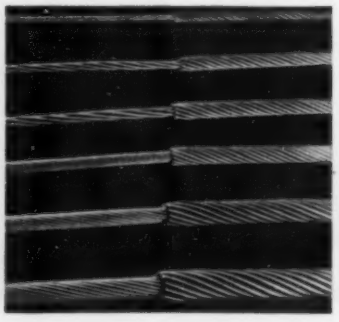

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AGENTS IN PRINCIPAL CITIES

M. A. Elliston has been appointed manager of the Abilene branch of the **Graybar Electric Co.**, Dallas District Manager **V. A. Elmblad** has announced. He succeeds **L. P. Bell** who has retired after 39 years with the company.

Mr. Elliston joined Graybar's Dallas office in March, 1936, as a truck driver. He soon advanced to warehouseman, a position from which he left Graybar for military duty, returning to Dallas as office salesman in January, 1946. A year later he became city salesman, which position he held until his new assignment.

Wynn T. Sullivan has been appointed fixture advertising and merchandising manager for the **Lighting Division of Sylvania Electric Products, Inc.** He will make his office at the company's fixture headquarters in Wheeling, W. Va., according to an announcement by Thomas G. Hearn, sales manager of Sylvania's Fixture Department.

W. T. Sullivan

Mr. Sullivan was previously employed as advertising manager by Heyl and Patterson, Inc. of Pittsburgh and was associated with the market research sales promotion department of Steel Magazine, Penton Publishing Co., Cleveland, Ohio.

Sola Electric Co., Chicago, announces two executive appointments. **Nelson P. Marshall**, formerly manager, Eastern Division sales, has been appointed general sales manager. Former Western Division Sales Manager **Pat J. Morrisey** has been appointed to the post of field sales manager.

Mr Marshall joined Sola Electric Co., Eastern Division, in 1944. Five years later he was elevated to manager, Eastern Division Sales, the post he has held until his recent appointment.

Mr. Morrisey has been associated with the electrical and electronic industries for 17 years, ten of which have been with Sola Electric Co.

NEW DUO-GUARD PUSHMATICS® eliminate fuses . . . provide push-button convenience, double safety.

RESIDENTIAL BUILDING IS BOOMING, creating a big market for BullDog Electri-Centers—available in 12-, 14-, 18- and 20-circuit capacities. Pushmatic breakers for the Electri-Centers are interchangeable and are available in 15-, 20-, 30-, 40- and 50-amp. ratings. Listed by UL.

BULLDOG PUSHMATIC ELECTRI-CENTERS WITH 100-AMP SERVICE ARE THE

Mark of a Modern Home!

and your customers know it!

MORE CONVENIENCE! MORE PROTECTION! MORE SALES APPEAL!

The trend today is toward adequate wiring in modern homes—and toward BullDog Pushmatic Electri-Centers® as the modern way to fill the bill.

The reasons are these—all big selling points to home buyers, builders and customers alike: (1) Full 100-amp adequate wiring capacity to handle present and future requirements. (2) Push-button convenience that puts an end to the "hunt and fumble" of fuse changing. (3) Double automatic protection that safeguards branch circuits and lamp or appliance cords. (4) One attractive panel handles everything—large 220-volt appliances, main lighting disconnect, and branch circuits.

Push the sale of Pushmatic Electri-Centers and *push up* your profits. Easy to stock, easy to sell, easy to install. Write BullDog Electric Products Company, Detroit 32, Michigan.

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IF IT'S NEW
. . . IF IT'S DIFFERENT
. . . IF IT'S BETTER . . . IT'S

BULLDOG
ELECTRIC PRODUCTS COMPANY
A Division of I-T-E Circuit Breaker Company

Export Division: 13 East 40th Street, New York 16, New York. ***In Canada:*** BullDog Electric Products Company (Canada), Ltd., 80 Clayson Road, Toronto 15, Ontario.

CONSULT THE FOLLOWING SOUTHERN REPRESENTATIVES:

Wilson Electrical Equipment Co., 2930 Commerce St., P.O. Box 1725, Houston, Tex.; 101 E. Maple St., San Antonio, Tex. • Walker Electrical Co., Inc., 70 Bennett St., N.W., P.O. Box 8, Station D, Atlanta, Ga. • Standard Electric Mfg. Co., 2401 Federal St., Dallas 1, Tex. •

Free bulletins

available to our readers

Electrical Manufacturing Co., Box 217, Battle Creek, Mich., has announced the publication of a new **pole line hardware catalog.** The catalog is unique in that it is made to lie flat when open and stay at the page it is opened to. These pages are removable, and are well indexed for quick reference. The drawings are simplified for clarity and the descriptive data is easy to read.

For your free copy, circle number B401 *on the coupon on page* 84.

Incandescent Lamps (Booklet A-6442), a 12-page booklet available from your nearest **Westinghouse** Lamp Division Office, describes the physical, electrical and operating characteristics of modern incandescent lamps.

Prepared for an audience of engineers, architects, lighting specialists, and students, the booklet discusses in detail such topics as actual and ideal lamp efficiencies; the function, manufacture, and assembly of lamp parts; the relationship of operating voltage, light output, and lamp life; and the effects of burning position, vibration, and heat on lamp performance. A concluding section discusses uses, operating characteristics, and mechanical construction of principal lamp types and gives recommendations for their application.

The booklet is illustrated with many drawings, diagrams, graphs, and tables.

For your free copy, circle number B402 *on the coupon on page* 84.

Complete dimensions, specifications, and performance data on Hartzell's new **non-overloading utility blowers** with backward curved blades is presented in concise, easy-to-use form in a new bulletin, BC-11, issued by the **Hartzell Propeller Fan Co.**, Piqua, Ohio.

Data is given for the complete line which includes 12¼ to 36½ inch belt-drive blowers, 12¼ to 33 inch direct-drive models, 12¼ to 36½ inch Arrangement 2 blowers; 24½ to 49 inch Arrangement 3 single width, single inlet blowers and 12¼ to 49 inch Arrangement 3 double width, double inlet blowers.

For your free copy, circle number B403 *on the coupon on page* 84.

Publication of a new **pocket catalog for electric motor controls**, Booklet No. 5411, is announced by **Furnas Electric Co.**, 1064 McKee St., Batavia, Ill. This pocket edition contains 46 pages of motor control photographs, specifications and prices. It is designed as a convenient ready reference for magnetic starters and contractors, push buttons, combination starters, drum controllers, master, foot, limit and pressure switches.

For your free copy, circle number B404 *on the coupon on page* 84.

Rodale Manufacturing Co., Inc., Emmaus, Pa., manufacturers of **electrical wiring devices** for home, industry, and community, has just issued its new 1955 48-page catalog which shows more than 600 products, including many new items introduced by the firm for the first time.

The entire catalog is printed in two colors and employs a three-hole punch system of binding for simplification of processing by the trade. Certain sections of this new catalog feature a "thumbspot" product finder; illustrations of the various products are printed close to the margin in a yellow column for quick identification by thumbing through the catalog.

For your free copy, circle number B405 *on the coupon on page* 84.

Uptegraff **distribution transformers** Type UD, ranging from three to 100 KVA, are detailed in a new eight-page bulletin (No. 135) published by **R. E. Uptegraff Manufacturing Co.**, Scottdale, Pa. These are conventional overhead, oil-immersed, Class OA distribution transformers. A feature of the bulletin is a comprehensive chart showing the electrical and mechanical characteristics for standard ratings. Also included are such data as outline dimension drawings, support lug and hanger details, standard tap ratings, bushing terminal sizes and standard low-voltage connections.

For your free copy, circle number B406 *on the coupon on page* 84.

A new **farm lighting booklet**, "Outdoor Lighting for Your Farm," has been announced by **Sylvania Electric Products, Inc.**, 1740 Broadway, New York 19, N. Y. The booklet, which covers a wide variety of farm lighting applications, is available without cost.

Some of the subjects covered in

AIR-FLO MODEL 610
AUTOMATIC CEILING SHUTTER
Outstanding Features of Model 610 Automatic Ceiling Shutter
• Neutral Aluminum Color Blends With Any Decoration and Color Scheme
• Flush Appearance
• One Continuous Panel Regardless of Width
• Maximum Free Air Opening
• Fusible Links Release Spring Action in Case of Fire
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*Southeastern Factory Warehouse 177 Harris St., N. W., Atlanta, Ga.
MANUFACTURED BY AIR CONDITIONING PRODUCTS COMPANY
2340 W. LAFAYETTE • DETROIT, MICHIGAN

St., N.W., P.O. Box 8, Station D, Atlanta, Ga. • Standard Electric Mfg. Co., 2401 Federal St., Dallas 1, Tex. •

the booklet are circuits, power distribution centers, pointers on planning outdoor lighting, wiring systems, selecting outdoor fixtures, installing switches, and types of lamps for outdoor use. Photographs and sketches illustrate recommended farm lighting installations.

For your free copy, circle number B407 *on the coupon on page* 84.

A new series of **high-capacity steel-clad impulse oil circuit breakers** in ratings of 138 KV, 161 KV, 230 KV and 330 KV are described in a new bulletin. GEA-6157, offered by **General Electric Co.**, Schenectady 5, N. Y.

The 330 KV unit, largest ever built, is now offered in the company's regular switchgear line. Advantages of "lens-shape," simplification of shipping, installation and maintenance, dimensions, accessories, and cross sections are covered in the 16-page publication. Included on the back page is a handy list of bulletins on equipment ranging from complete outdoor stations to reclosers for rural lines.

For your free copy, circle number B408 *on the coupon on page* 84.

Amcolenses, precision engineered lens for **lighting equipment**, are the featured items in the new, 60-page catalog, just issued by **Art Metal Co.**, Cleveland 3, Ohio. The new catalog was designed for guidance in the selection and evalution of unified lighting.

Amcolenses are a lighting research development of the Art Metal Company and are available only in Art Metal lighting equipment. Nine different Amcolens styles are offered in a range of 18 popular sizes.

Comprehensive factual data is presented on all Art Metal lighting equipment including performance information based on unbiased test results from Electrical Testing Laboratories, Inc.

For your free copy, circle number B409 *on the coupon on page* 84.

Fans for home, office and industry. A new eight-page **fan brochure**, recently announced by **Dayton Electric Manufacturing Co.**, 126 S. Oakley Blvd., Chicago 12, Ill., contains specifications and list prices of the company's complete line of attic, window, exhaust and circulating fans.

For your free copy, circle number B410 *on the coupon on page* 84.

Feedrail Corp., 125 Barclay St., New York 7, N. Y., has issued a bulletin (No. 47) describing their 60 Ampere **overhead trolley busway electrification system** which has become increasingly popular among users of business machines. Ex-

BEST BY TEST!

LEV-O-LOCK DEVICES TESTED FOR QUALITY AND PERFORMANCE!

Every LEV-O-LOCK device is carefully checked and inspected before leaving the factory. Individual items are selected at random from the production line and submitted to exhaustive tests in the new Leviton Testing Laboratories. The "pull-out" test, illustrated, is just one of the many tests to which these devices are subjected.

LEV-O-LOCK, the modern design electrical connector that locks securely with a turn of the cap, to provide a secure connection that will not shake or pull loose . . . assures uninterrupted flow of power. LEV-O-LOCK devices are a must in factories for all electrical equipment; in offices for electric office machines; on farms for electric milking machines; in the operation of portable power tools and other electrical apparatus.

These new devices incorporate every up-to-the-minute advance in design and engineering. New features include heavy gauge phosphor bronze, double wiping contacts for all receptacles. Extra large terminal screws and ample room make wiring fast and easy. Rigid quality control from raw material to final inspection is your assurance of a superior product.

Try LEV-O-LOCK yourself and you'll agree that LEV-O-LOCK devices are tops for quality and performance at sensible prices. Why pay more when the best costs less!

LEV-O-LOCK devices available in 2, 3 and 4 wire caps, connectors and receptacles in 10 and 20 Amp. ratings. Also 3 and 4 wire rubber caps. Listed by Underwriters' Laboratories and C.S.A.

your best jobs are done with . . . LEVITON

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Chicago, Los Angeles, Leviton (Canada) Limited, Montreal

Those who really know say:

CERTIFIED CBM CERTIFIED by ETL BALLASTS

give best results!

• No one knows better the value of CERTIFIED CBM BALLASTS than the manufacturers of fluorescent tubes. For the satisfactory performance of their lamps is vitally dependent on the ballasts that operate them. They know CERTIFIED CBM BALLASTS are Tailored to the Tube.

CHAMPION *says:*

"Fluorescent lamps are designed to operate at specific electrical values. The use of auxiliary equipment that has been proven to meet these agreed upon standards will assure the user maximum value for his lighting dollar with a minimum of operational failures. Certified Ballasts are inexpensive insurance."

GENERAL ELECTRIC *says:*

"The life and light output ratings of fluorescent lamps are based on their use with ballasts providing proper operating characteristics. Ballasts that do not provide proper electrical values may substantially reduce either lamp life or light output, or both. Ballasts certified as built to the specifications adopted by the Certified Ballast Manufacturers (CBM) do provide values that meet or exceed minimum requirements. This certification assures the lamp user, without individual testing, that lamps will operate at values close to their ratings."

SYLVANIA *says:*

"The light and life ratings of fluorescent lamps are based on three hour burning cycles under specified conditions and with ballasts meeting American Standards Association specifications. Ballasts marked with the CBM emblem and certified by Electrical Testing Laboratories, Inc., meet ASA specifications."

WESTINGHOUSE *says:*

"Use ballasts that are tested and Certified by Electrical Testing Laboratories or ones that are otherwise known to meet the specifications of the lamp manufacturer. These will give best results with Westinghouse fluorescent lamps."

That's why CERTIFIED CBM BALLASTS merit the slogan—Tailored to the Tube.

Certified CBM Ballasts are built to assure quiet operation and long trouble-free life.

CERTIFIED BALLAST MANUFACTURERS

Makers of Certified Ballasts for Fluorescent Lighting

2116 KEITH BLDG., CLEVELAND 15, OHIO

plained is how the installation of Feedrail systems will eliminate costly rewiring when relocating machines, remove the floor cables and outlets, lower maintenance costs and reduce machine shut-down time.

For your free copy, circle number B411 *on the coupon on page* 84.

A four-color booklet entitled "A new world in home lighting . . . at your fingertips" has been issued by **Superior Electric Co.**, Bristol, Conn. It describes the **Luxtrol Light Control** as "a revolutionary advance in home lighting."

Luxtrol Light Control is a new development which enables homeowners to vary light intensity of both incandescent and rapid start fluorescent lamps. Any degree of illumination, from complete darkness to full brightness, can be had at the turn of a dial.

For your free copy, circle number B412 *on the coupon on page* 84.

The Okonite Co., Passaic, N. J., is offering a new booklet on **rubber-insulated Loxarmor cable** constructions, a cost-saving cable design for use in racks or trays for applications where rigid conduit systems are either unnecessary or undesirable. Loxarmor Cable with Okonex insulation may be operated at conductor temperatures up to 85C both indoors and outdoors at voltages up to 15kv.

Current carrying capacities, dimensions, installation and handling techniques, splicing and terminating drawings and instructions and fittings are included.

For your free copy, circle number B413 *on the coupon on page* 84.

A four-page folder illustrating and describing their new line of **fluorescent lighting fixtures** with Plexiglas diffusers for homes, schools or businesses, is available from **Robert Manufacturing Co.**, 99 Dell Glen Ave., Lodi, N. J.

For your free copy, circle number B414 *on the coupon on page* 84.

The 1955 edition of the G-E **Instrument Transformer Buyer's Guide**, containing basic, up-to-date information on the complete **General Electric** line, has been announced as available from the company at Schenectady 5, N. Y.

The fully illustrated, 100-page publication, designated GEC-1028, contains ratings, ASA accuracy classifications, and prices of all Standard G-E indoor and outdoor potential and current transformers. Listings of ratio and phase-angle tests, tables of replacement types, and mechanical and thermal data are included.

For your free copy, circle number B415 *on the coupon on page* 84.

KILLARK electrolets ...pioneers in ALUMINUM conduit fittings & fixtures

- Entrance Fittings
- Explosion Proof Fittings
- Conduit Bodies
- Explosion Proof Switches
- Vapor-Tight Light Fixtures
- Explosion Proof Light Fixtures
- Sealed Beam Fixtures
- Flush Switch Fittings
- Dust-Tight Fixtures

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Atlanta, 69 Mills St., N.W.
Dallas, 1903 Griffin St.
Baltimore, 11 W. 25th St.

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ELECTRIC MANUFACTURING COMPANY
VANDEVENTER AND EASTON
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WIRING DEVICE

PYLETS

SAVE TIME AND MONEY

FS and FD Series
weather-resistant watertight

ER Explosion-proof and
dust-tight series for
hazardous locations

Pylets take all standard convenience outlet and switch devices of the flush mounting type and protect them from corrosion and failure. Standardize on cast metal PYLETS for lower maintenance cost as well as the economy of complete interchangeability of devices and covers.

FS and FD PYLETS are available in 1, 2, 3 & 4 gang with a complete selection of covers.

ER Series 1 & 2 gang equivalent types for hazardous locations complete with wiring devices are also available.

Sold Nationally through authorized distributors

Write for bulletin.

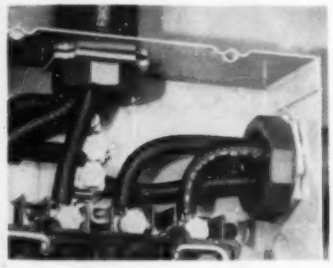
THE PYLE-NATIONAL COMPANY
WHERE QUALITY IS TRADITIONAL
1354 North Kostner Avenue • Chicago 51, Illinois

New products

(For more information, use coupon on page 84)

T&B connection concept promotes wiring safety

RACEWAYS, one of the key safety features of modern electrical wiring, have been made even safer through a new connection concept using built-in insulation. The announcement was made recently by its developer, the Thomas & Betts Co., 72 Butler St., Elizabeth 1, N. J., who are offering built-in plastic bushings to prevent wiring from coming in contact with the metal of



the raceway at the outlet. The bushings are colored bright blue for easy identification.

According to company officials, this concept of raceway connection is a striking improvement for the systems of metal tubing that enclose and protect electrical wiring from outside damage. The new development follows a fast-growing trend spurred by the National Electric Code, which specifies insulation at raceway outlets for No. 4 conductor or larger.

Called the T&B Insuline, the new type fittings are designed for rigid, EMT and flexible raceways. They protect wire insulation from damage and reduce up to 50 per cent the effort required by an electrician to pull wiring through a raceway, tests reveal. Self-insulated raceway connectors also provide lowest installed cost, because they eliminate the possibility of an electrician forgetting the separate insulating bushing required with ordinary types.

For additional data, circle item 416 on the handy coupon on page 84.

New Raco handy boxes and covers announced

A COMPLETE new line of Raco Handy Boxes and Raco Handy Box Covers is announced by All-Steel Equipment, Inc., Aurora, Ill.

These new Handy-Boxes are deep drawn, one-piece, solid steel boxes. Corners are full metal thickness, strong, smooth and rounded so they will not crack. The box bottoms are stronger and flatter for easier mounting on flat surfaces.

A complete new line of formed Raco Handy-Box Covers offers still further advantages. The new covers have rounded corners and curved edges forming a neat appearing flange when installed.

These new boxes and covers are well finished with bright zinc plating. They are clean, have smooth edges that will not cut fingers during installation. They are real time savers for contractors and electrical workers.

For additional data, circle item 417 on the handy coupon on page 84.

Jefferson Electric expands fuse line

JEFFERSON ELECTRIC Co., Bellwood, Ill., has expanded its line of fuses to include a dual-element Saf-T-Lag fuse for use in home wiring systems.

Jefferson has added a range of 17 new dual-element Saf-T-Lag fuses, for use in homes to its line of fuses which it has manufactured for forty years. The number of various fuses made by Jefferson now totals 356. The trade names of the major units include: Gem plug and cartridge fuses; Fustat, a combination fuse and thermal cutout; Saf-T-Lag thermal fuse; Union renewable and Super-Lag renewable.

For additional data, circle item 418 on the handy coupon on page 84.

Fast-On connector speeds installations

A NEW, PATENTED low-cost connector that speeds the installation of non-metallic sheathed cables in junction boxes to save time and money has been announced by Denman Products Co., 210 Bietz Bldg., Ravenna, Ohio.

Named the Fast-On Connector,

Type No. 2, the new unit is made of a special rustproof aluminum alloy and is listed by Underwriter's Laboratories, Inc. It fits 14-2, 14-3, 12-2, 12-3, 10-2, 10-3 and other wire sizes.

It can be installed in a few seconds without special tools. To install, the connector is merely inserted in the box, the wire is then inserted through the connector and the connector is crimped tightly onto the wire with regular electrician's pliers. The crimping automatically locks the wire, connector and box together. Connections are neat since the unit fits flush inside the box. There are no screws or nuts to turn, lose or rust. When removal is necessary, it can be done quickly merely by crimping in the opposite direction.

For additional data, circle item 419 on the handy coupon on page 84.

ITE develops 400-amp case circuit breaker

A 400-AMPERE-FRAME molded case circuit breaker—developed by I-T-E Circuit Breaker Co., 19th and Hamilton Sts., Philadelphia 30, Pa.—is reported to be the first of that frame size to be built. The new "KL" frame breaker is designed to bridge the gap between the present 225-ampere frame molded case circuit breaker and the 600-ampere model.

The new breaker saves cost and

space for customers who have previously had to use the larger, more expensive 600-amp-frame breaker in circuits carrying from 225 to 400 amperes.

The compact addition to the I-T-E line—more than one-third smaller than the 600 amp-frame breaker—measures nine inches wide, 15½ inches high and 5½ inches deep, including handle. It is designed for use in panel boards, switchboards, motor controls, bus duct plugs and individual enclosures.

The new "KL" unit is a thermal-magnetic circuit breaker with quick-make, quick-break operating mechanism. Interchangeable trip units provide continuous rating versatility from 125 to 400 amperes. Common trip operation is retained and an

SEE WHAT THEY'RE DOING with "BUFFALO" PROPELLER FANS!

Fourteen 72" NV Belt-Airs ventilate huge new Livestock Coliseum at Montgomery, Ala., exhausting at the rate of 770,000 cfm requiring only 42 horsepower.

Architects and Engineers:
Sherlock, Smith & Adams
Montgomery, Alabama

General Contractor:
Butler & Cobbs
Montgomery, Alabama

Heating and Ventilating Contr.:
McKenney's, Inc.
East Point, Ga.

One bank of Belt-Airs in Coliseum. Furnished with motor-operated shutters and drive side guards.

Discharge side of 72" Belt-Air showing broad, curved blades for high efficiency at slow speeds and low noise level. Gusseted motor and bearing supports can be seen on drive side. Blades die-stamped and panel assemblies one-piece welded construction for rigidity and strength.

More and more big ventilation jobs like this Coliseum are being handled by "Buffalo" Package Propeller Fans. Users and contractors like the idea of the first cost and installation savings of propeller fans — plus the fact that this improved and enlarged "Buffalo" line give the quiet, efficient performance so necessary to satisfactory air moving. These husky packages are now cooling large boiler rooms — exhausting fumes — moving air against as much as 1" static pressure. And you can select fan sizes all the way from 8" to 144" (the 12-foot size rated at 250,000 cfm!) *Request your copy of Bulletin FM-1234* on your company letterhead and see the jobs these fans with the "Buffalo" "Q" Factor* could be doing for you.

**The "Q" Factor — the built-in Quality which provides trouble-free satisfaction and long life.*

"Buffalo"

BUFFALO FORGE COMPANY
210 MORTIMER ST. BUFFALO, N. Y.
PUBLISHERS OF "FAN ENGINEERING" HANDBOOK
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.
Sales Representatives in all Principal Cities

INDUSTRIAL EXHAUSTERS BELTED VENT SETS PROPELLER FANS "E" BLOWERS-EXHAUSTERS

ELECTRICAL SOUTH
806 Peachtree St., N.E.
Atlanta 5, Ga.

April, 1955

Gentlemen:

Please send me the bulletins and catalogs or new product information as indicated.

(Print Plainly)

Name_____ Title_____

Company_____

Address_____

City & State_____

Circle numbers below. Bulletins, catalogs, or new product information will be mailed promptly.

B401	B402	B403	B404	B405
B406	B407	B408	B409	B410
B411	B412	B413	B414	B415
416	417	418	419	420
421	422	423	424	425
426	427	428	429	430
431				

☐ Enter my subscription to ELECTRICAL SOUTH and bill me at the special rate of 3 years for $2.00.

FOR MORE INFORMATION — Use this handy return coupon for requesting manufacturers bulletins or additional information on new products listed in these pages. Be sure to give firm name and your position or title.

over-current on any pole kicks out all poles simultaneously.

Extra auxiliary devices — shunt trips, undervoltage trips, auxiliary and alarm switches—can be mounted inside the breaker case. The new model, like other I-T-E circuit breakers, is factory-calibrated and sealed to prevent tampering.

The new "KL" breaker is available in ratings from 125 to 400 amperes; either two or three-pole; 600 volt alternating current or 250 volt direct current, 25,000 ampere maximum interrupting capacity.

For additional data, circle item 420 on the handy coupon above.

G-E adds wide range hook-on volt-ammeter

A NEW WIDE RANGE pocket size volt-ammeter for measuring alternating current and voltage quickly and accurately has been introduced by the General Electric Company's Instrument Department, Schnectady 5, N. Y.

Measuring only 9 1/8 by 3 7/16 by 1 9/16 inches, the new product is designated AK-4, and includes 150/300/750 volts AC as its volt ranges, according to G-E engineers.

Capable of measuring current on both insulated and non-insulated conductors without cutting the conductor or interrupting work, the new volt-ammeter is equipped with scales that automatically change when the range selector knob is turned, thus reducing the possibility of reading a wrong scale.

Current range of 10/30/100/300/800 amperes AC provides for the measurement of currents usually encountered in industrial or commercial circuits. In addition to the wide choice of ranges, a pointer stop mechanism has been incorporated contributing to the AK-4's versatility.

For additional data, circle item 421 on the handy coupon above.

Crown Products offers hand type wire stripper

A NEW INEXPENSIVE hand type wire stripper for general work and production jobs has been announced by Crown Industrial Products Co., 1248 Amsterdam St., Woodstock, Ill.

Fabricated of hardened steel construction throughout, the stripper has interchangeable, precision-milled stripping blades carefully matched to strip insulation clean without damaging the wire. It strips both stranded and solid wire.

A patented lock-open feature holds the jaws open automatically, so that the wire can be removed after stripping without crushing. Release of the jaws is accomplished with a single finger-tip touch on the lower handle, making it unnecessary to shift the grip on the stripper for the next operation.

Durable, but light in weight, the stripper is available in three models. Replacement blades are also available. Changing of the blades can be done in a matter of seconds by removing two screws.

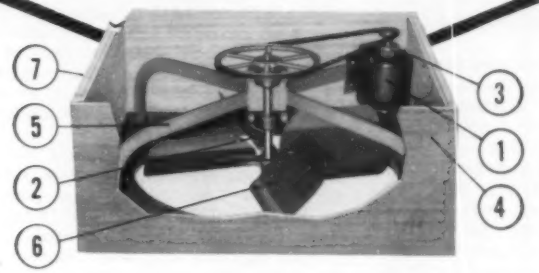
For additional data, circle item 422 on the handy coupon above.

Electromode develops new type heating panel

A NEW WALL-TYPE electric heating panel which combines the principles of both radiant and convection heating, has been announced by Electromode Corp., Rochester 3, N. Y. It has scientifically designed radiation fins of cast-aluminum which provides free flow of heated air, and special deflector channels which force the heat outward, permit secondary air flow, and keep the wall cabinet cool. Clean, healthful heat is radiated and circulated throughout the room, producing even temperatures without drafts. It is available in automatic models with built-in thermostat or in manually controlled models.

When you want maximum efficiency and economy in home cooling—

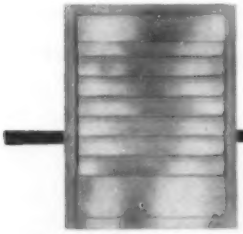
Get the "INSIDE" STORY on Air King ATTIC FANS



HORIZONTAL MOUNTED CEILING FAN

Here's the one attic fan you install — and forget! It's designed and built to operate efficiently — cool an entire house easily and quickly — with an absolute minimum of attention. Available in 5 sizes from 24" to 42" delivering 5500 CFM to 12,800 CFM. The ideal way to low cost "air conditioning" for one house or one thousand!

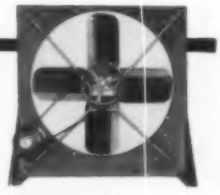
1. Motor is Thermoguard protected, Resilient Mounted, with Sealed Lubrication Ball Bearings. It won't short or burn out . . . absorbs vibration . . . requires no attention . . . insures smoother operation.
2. Shaft Mounted on Sealed-for-Life Ball Bearings set in solid rubber. Never requires lubrication, eliminates noise and vibration.
3. Handy box on motor for quick wiring — just bring BX or wire to box and hook. No need to remove motor.
4. Installs right in its own "Built-In" Frame. Saves time and materials.
5. Heavy Gauge Steel Construction Throughout.
6. Individually Weighed and Balanced Blades. Reduces motor strain and insures vibration-free operation.
7. Requires Minimum of Roof Clearance.



Horizontal Mounted Ceiling Fan LOUVERS

Rectangularly shaped Louvers permit the fan to be installed through the louver opening. Completely finished with chrome plated screws, no additional trim necessary. In air or electric motor operated models with handsome Ivory finish.

Louvers also available for Vertically Mounted Attic Fans. In air and electric motor operated models.



Vertically Mounted Attic Fans

Ruggedly constructed with fan bracket of heavy gauge bar stock. Heavy duty motor and provision for manual adjustment of belt tension. A truly low cost method for cooling an entire house. In sizes ranging from 24" to 48" delivering 5,500 CFM to 18,000 CFM.

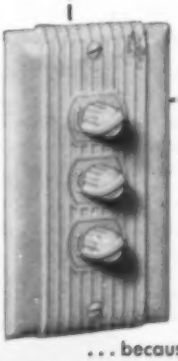
Send Today for complete Berns Air King Attic Fan Catalog

BERNS MANUFACTURING CORP.
Dept. ESA, 3050 No. Rockwell St., Chicago 18, Ill.

Modern beauty

For modern buildings, specify P&S Roto-Glo . . . the only truly modern light switch. Combines functional design . . . feather-quiet operation . . . *glows in the dark.* Precision-built mechanism . . . 15 Amp, 277 Volts A.C. . . . designed to handle fluorescent loads with ease.

Write Dept. ES for the complete Roto-Glo story.



Available in P&S Despard and conventional strap types

it's a ROTO switch
it's a LUMINOUS switch
it's a QUIET switch

NEW ROTO-GLO Trade Mark
Quiet Switch

. . . because switches should be SEEN . . . not heard

PASS & SEYMOUR, Inc., Syracuse 9, New York
71 Murray St., New York 7, N. Y.
1229 W. Washington Blvd., Chicago 7, Ill.

Absolute safety is assured because of the Electromode patented, cast-aluminum heating element which is completely sealed in. There are no glowing coils, no glass or ceramics to break, and no danger of fire, shock, burn or explosion. This heating element is guaranteed for five years.

The unit is rated at 1100 watts, 3753 Btu, and is available for 120 or 240 volts. Overall dimensions are 21 inches wide, 17 inches high, and 2¾ inches deep.

For additional data, circle item 423 on the handy coupon on page 84.

New device indicates power line failures

A NEW, LOW COST electro-mechanical assembly that quickly indicates a fault condition on power lines and eliminates time consuming checks and danger to servicemen on high tension lines has recently been developed by R. G. Genzlinger, Inc., Neshaminy, Pa.

The device, called the "Silent Sentry Line Fault Indicator," is permanently installed at spaced points on transmission lines throughout the power system. When a power failure occurs, servicemen visually inspect the spaced Indicators for a

flag signal, which indicates the area of the trouble. No further tests are required and no line disconnects are necessary to insolate trouble area regardless of branch lines.

Operation of related systems leading from the substation will not be disrupted, saving money and eliminating complaints. As soon as the trouble has been corrected, the device resets itself automatically to a normal position.

Mounting of the Silent Sentry Line Fault Indicator is easily accomplished by means of a hot line stick. The mounting arrangement is such that the line conductor passes through the yoke-shaped magnetic cores of the unit. The simply constructed device is compact and operates under all weather conditions.

For additional data, circle item 424 on the handy coupon on page 84.

Leviton adds 3-wire grounding cap adaptor

A NEW ADAPTOR for use with three-wire grounding caps has been introduced by Leviton Manufacturing Co., Brooklyn 22, N. Y. The three-wire adaptor (Catalog Number 5017) has been designed to comply with a new Underwriters' Laboratories, Inc., ruling which specifies three-wire grounding attachment caps on portable electrical equipment intended for industrial use.

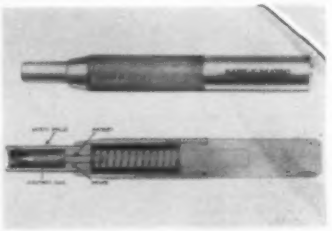
Designed to adapt standard two-wire outlets for immediate use with three-wire grounding caps and manufactured to withstand rough treatment, the adaptor is made of rugged bakelite and won't crack or chip. Other features include: polarized parallel blades, parallel polarized slots and U-shaped grounding hole. It comes with three-inch green grounding lead with hook-type terminal lug for connecting to ground. The lead is anchored to the adaptor with a green hexagon head screw. It is made to UL specifications and standards, and rated 15A-125V.

For additional data, circle item 425 on the handy coupon on page 84.

Safety nail driver cuts work, time and hazards

THE SAFE-T-MATIC nail driver for driving masonry nails into concrete, cinder blocks, concrete blocks, light and medium gauge metals quickly and safely has been developed by the Safety Nail Driver Corp., Clifton, N. J.

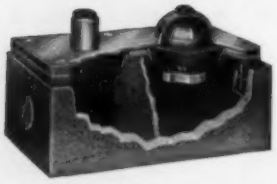
The new tool features a built-in permanent magnet, which holds the



nail in the correct position, and a sliding safety shield, which cuts working time 80 per cent and eliminates the danger of flying nails. Nails driven with the Safe-T-Matic driver have strong holding power and do not require use of star drills, plugs and screws. The new tool takes masonry nails of ½ to 1⅛ inches length. It can be used for fastening clamps

Latrobe PRODUCTS

FLOOR BOXES • WIRING SPECIALTIES



No. 252-R Two Gang Adjustable Floor Box

"Latrobe" Floor Boxes and Wiring Specialties are top performers because they are expertly designed of the finest materials.

"Latrobe" Products are proof that the shortest road to efficiency and economy lies through quality.

Floor Boxes • Cover Plates • Pipe or Conduit Hangers • Gang Boxes • Nozzles • Fish Wire • Cable Supports • Junction Boxes • Insulator Supports • Staples and Cable Clips

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CARY CHAPMAN & COMPANY — 702 Whitehall St., S. W., Atlanta, Ga. / 213 S. Front St., New Orleans 12, La. / 445 English St., Greensboro, N. C.

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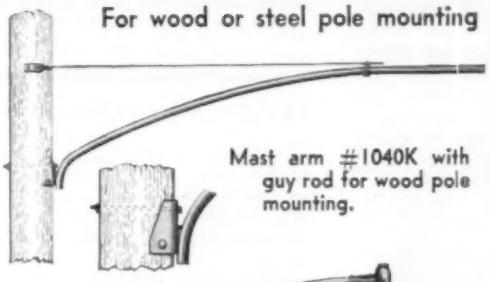
FULLMAN MANUFACTURING CO.

LATROBE . . . PENNSYLVANIA

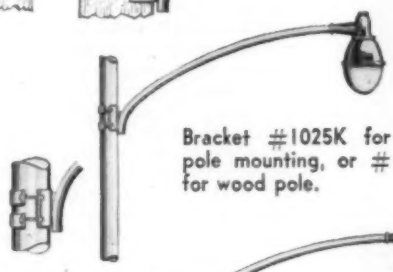
KERRIGAN *Weldforged*
Steel Brackets & Mast Arms

For Economy & Beauty

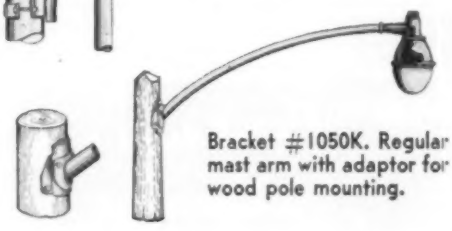
For wood or steel pole mounting



Mast arm #1040K with guy rod for wood pole mounting.



Bracket #1025K for steel pole mounting, or #1035K for wood pole.



Bracket #1050K. Regular mast arm with adaptor for wood pole mounting.

Kerrigan's complete line of brackets and mast arms are carefully engineered for easy installation and wiring. They meet all I.E.S. street lighting recommendations. So, take advantage of your wood poles now in place and brighten up your city or town NOW!

Let us help you

solve your city's lighting problems. Send for our FREE catalog containing engineering data. It shows how simple installation really is.

KERRIGAN IRON WORKS, INC.
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PREWAY Inc.

is proud to announce

the appointment of

The
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Company
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Texas
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and the city of
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to better serve distributors in this area

GAS AND ELECTRIC BILT-IN RANGES

ELECTRIC RANGES

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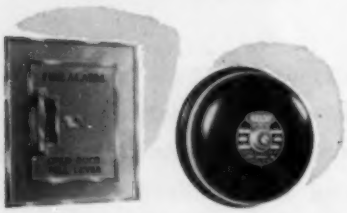
For 35 years PREWAY has concentrated on home appliances — building a reputation for leadership in engineering developments, in precision manufacture and in product styling. Millions of dollars of PREWAY products are now in use all over America and in many foreign countries.

PREWAY Inc.
WISCONSIN RAPIDS, WISCONSIN

"REAL fire PROTECTION TAKES A THOROUGHBRED"

Best in the field . . . a Faraday fire alarm system that provides the exact fire warning you need. From Coded Systems—which indicate *when* and *where* a fire is reported, to general alarm systems, Faraday has been *proven* the accepted safeguard in hundreds of public and private buildings.

Where human safety—or valuable property is at stake . . . look to Faraday for the complete, dependable fire warning system Write, today, for details.



Modern, attractive stations and signals . . . designed and built for any decorating plan.

SPERTI FARADAY FIRE PROTECTION

Sperti Faraday Inc.
ADRIAN, MICHIGAN
SPERTI FARADAY OF CANADA, LTD., MONTREAL, QUEBEC

to cement or cinder block walls or cables, conduits, tubing, brackets, fixtures, bracing, cornices, gutters, leaders, etc.

For additional data, circle item 426 on the handy coupon on page 84.

Aluminum fork light introduced by Killark

A NEWLY DESIGNED fork light has been introduced to the trade by the Killark Electric Mfg. Co., Vandeventer and Easton Ave., St. Louis 13, Mo.

The unit consists of adjustable, non-rusting aluminum fittings that

are lightweight, completely weatherproof, and easy to use. The assembly consists of an aluminum two-tine fork, ½ inch extension, conduit nipple, plug and sealed-beam flood lamp.

All units are supplied with rubber covered wire and plugs. Can be furnished with or without weatherproof switch.

For additional data, circle item 427 on the handy coupon on page 84.

Carter introduces 32-watt Circline

DEVELOPMENT of a new 32-watt Circline lighting fixture has been announced by the Carter Lighting Co., Chelsea 50, Mass. Called the "Venus," the new fixture is designed to provide maximum light output without glare. It incorporates Carter's perforated steel louvers, which serve as both lamp supports and glare-eliminating baffles.

The Carter "Venus" is available in baked white enamel with a chrome center ornament, or in all-chrome. Instant-lighting ballasts are used.

For additional data, circle item 428 on the handy coupon on page 84.

G-E announces two new service entrance cables

TWO NEW service entrance cables, Type SE Style U and Type SE Style A, with heat-resistant insulation, increased current-carrying capacity, and better appearance have been announced by General Electric Company's Wire and Cable Department, Bridgeport 2, Conn.

The 75 C copper temperature of these new service entrance cables provides larger current-carrying capacity than formerly in the same size cable. The new special aluminum paint finish gives these new cables a clean, bright and attractive appearance.

For additional data, circle item 429 on the handy coupon on page 84.

Harvey Hubbell announces new grounding-type outlet

A NEW THREE-WIRE grounding-type convenience outlet designed for ground exposed metal parts of portable electrical equipment has been announced by Harvey Hubbell, Inc., Bridgeport, Conn. The unit, known as Catalog No. 5252, is described as a competitive, yet highly dependable, duplex, flush mounted receptacle for all practical applications.

Features of the Hubbell 5252 outlet include large head binding screws for conventional wiring, plus a hexagonal green screw to donate grounding wire. A break-off feature is provided for two circuit installations. It may be used with both metallic or non-metallic wiring systems. It is available in brown bakelite No. 5252 and ivorine No. 5252-I.

For additional data, circle item 430 on the handy coupon on page 84.

Rome service drop cable eliminates tree trimming

A NEW TYPE of service drop cable designed especially to withstand the abrasive wear and cutting action of tree limbs has been developed by Rome Cable Corp., Rome, N. Y. This new cable is known as TreePlex.

To the already tough polyethylene insulation covering each power conductor, Rome has added a tight, thin (.005 inch) sheath of Nylon. This compound has been heat and light-stablized, for extra-long weather resistance.

Laboratory tests show that this Nylon sheath has increased the wear resistance of the new TreePlex cable by more than 50 times, as compared with standard Triplex service drop cable. This greatly increased capacity to withstand abrasion and impact makes it possible to install TreePlex directly through heavy trees, without any necessity for tree-trimming or tree guards.

In addition the Nylon sheath provides a higher factor of safety against current overload; resists heat deformation, flame and burning.

Rome Neutral-supported TreePlex

Service Drop Cable is available in duplex, triplex and quadrex types.

For additional data, circle item 431 *on the handy coupon on page* 84.

Economic comment

(*Continued from page* 5)

further indicates that most construction workers have little to fear from economic recession in 1955.

The operation of a government is business, too. Many people lose sight of this fact when the question of tax reductions is brought up for discussion. Often politicians themselves cause some confusion for one can easily see the influence that this major expense item has upon party loyalty and support. However, one must not lose sight of the fact that this nation has operated too long on a deficit economy.

It is high time that the American people seriously consider the benefits to be gained from a surplus condition in government operations. Fortunately, most recent efforts to promote a reduction in federal taxes ended in failure. Were this not the result, the national government might not have reached a possible balanced budget for many years to come. Wise heads must inevitably conclude that sound government must be bought with an equitable, yet substantial, tax payment.

Supplying tomorrow's load

(*Continued from page* 42)

stay with you?

3. Have you combed your engineering jobs to be sure your engineers are offered challenging work?

4. Do you provide opportunities for continued education?

5. Do you have a planned management development program to insure that the man can develop at a rate commensurate with his potential?

6. Are the people who contact the young man during recruiting and training periods aware of the plans and opportunities you see in your growth?

7. Are you close to the colleges and have you supported them in their financial difficulties?

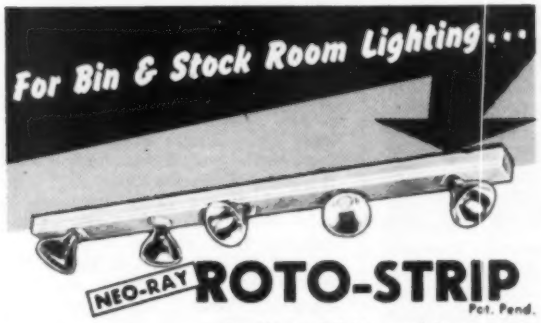
8. Have you encouraged young men to take specialized training for the power industry through scholarships and fellowships?

9. Have you cultivated the professors, helped them keep up to date, and supported them with professorships in power engineering?

10. Do you provide teaching aids to sell your many challenges to young people?

These are just a few points. If you can only answer yes to half, you should not be satisfied. In short, the degree to which you do these things will determine the quantity and the quality of the engineering talent you are able to attract. These incentives will boost your bargaining power by giving you a story that is full of both engineering challenge and opportunity as well as security. Sell it to the undergraduate. Only thus will you cease to be the poor relation in the lineage of electrical engineering.

If the public utilities do not assure themselves today of the engineering leadership they will need tomorrow, the consequences — by the very nature of your service— will be felt by all industry—even by the nation itself.



NEO-RAY **ROTO-STRIP** Pat. Pend.

For plenty of light . . . right where you want it — use NEO-RAY ROTO-STRIP. Costs so little . . . does so much. Low cost installation . . . simple maintenance. No wonder more and more stock rooms of manufacturers, wholesalers, retailers and institutions depend on this newest advance in lighting.

This complete shallow unit has built-in recessed roto sockets that swing 90° in all directions through a complete 360° circle . . . and stay put at any angle. Available in stock sizes of 2'-3'-5' and 8' lengths.

Kansas • Missouri
Bob Anderson Company
4908 West 72nd St.
Kansas City 15, Mo.

Arkansas • Louisiana
Mississippi • West. Tenn.
Pierre E. Bagur, Jr. & Co.
International Trade Mart
New Orleans 12, La.

Texas • Oklahoma
Walter J. Huemmer
Dallas Transfer &
Terminal Warehouse Bldg.
Dallas 2, Texas

Kentucky
Swan Sales Company
1105 Chestnut St.
Ashland, Ohio

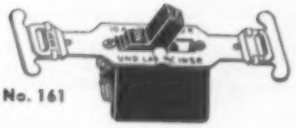
Alabama • Florida
Georgia
N. Carolina
S. Carolina
Virginia
East. Tenn.
Walter F. Nelson
Sales Agency
Bona Allen Bldg.
Atlanta 3, Ga.

Mfrd. by: NEO-RAY PRODUCTS, INC., 315 E. 22nd St., New York 10, N. Y.

be SURE . . . be SAFE . . . choose

MASSEY **WIRING DEVICES**

Toggle Switches with plaster ears



MASSEY Toggle Switches are UNDERWRITER'S LAB. APPROVED and meet Federal Specifications No. W S890. Illustrated are No. 150 and 161, single pole switches, rate 5 amp. 250 V. 10 amp. 125 V. Available in brown and ivory. Complete with large head 6/32 screws. Boxed for counter and shelf displays.

Write for Complete Catalog

A. H. MASSEY, INC.

P. O. Box 206 Derby, Conn.

A FOUR-IN-ONE TOOL FOR ELECTRICIANS
SLITTER
STRIPPER
CUTTER
SKINNER

STRIPEX

The new STRIPEX is a wire skinner; cable slitter; waste, wire, and cable cutter all-in-one tool! Made of steel, nickel plated. Replaceable blade. STRIPEX makes wiring easy and fast, slits and trims all the way into junction box.

Other B.E.P. Tools

B.E.P. PULLER REEL . . . acts as a big handle, makes wire pulling easy!

N.E. BEND SNAKE LEADER . . . leads fish tape thru any number of bends, flips easily out of box to attach wires.

OTHER B.E.P. PRODUCTS: Fish Tape, B.E.P. Puller, K.O. Box HANGER.

Order from your Electrical Wholesaler

Burbank
Electrical Products
BURBANK, CALIFORNIA

MEMO

For the latest catalogs on the newest lighting fixtures write to

PRESCOLITE
2229 - 4th Street
Berkeley 10,
California

Distribution substations

(*Continued from page 36*)

effect group regulation to the short and long feeders. The regulator-reactor-transfer bus scheme can also be utilized to give individual feeder regulation if required.

The low voltage selective substation is not limited to two transformers, but can consist of any number, each with its associated subtransmission supply, low voltage bus, feeder breakers, and tie breaker to adjacent bus sections.

The duplex substation utilizes the breaker-and-a-half scheme for supplying two feeders (Fig. 11a). The substation is supplied through two transformers and two separate subtransmission circuits as indicated by the diagram. Each feeder is normally fed by its own load-ratio-control transforming section to provide individual feeder voltage regulation.

In case of a transformer failure or a subtransmission line outage, automatic undervoltage control relays open the associated transformer secondary breaker and close the bus tie breaker. Thus, service is restored to the interrupted feeder through the remaining transformer. As in the case of any double-ended substation, the transformers should be selected so that one transformer can carry the load of both feeders during emergency conditions with an acceptable overload above the fan-cooled rating.

Besides providing individual feeder regulation, this type of substation makes it possible to remove any breaker or transformer from service for maintenance purposes, and the by-passing is done with full capacity breakers instead of with devices having limited or no interrupting rating.

The Duplex type substation principle can be expanded as in Fig. 11b to serve four feeders from the two transformers. This type is commonly called the Double-Duplex substation.[9] In this arrangement, there is bus regulation for each pair of feeders instead of individual feeder regulation.

To illustrate how most master unit substations may be expanded as the load grows, one transformer and two feeder breakers of a Double Duplex Substation can be installed initially; and the second transformer, two feeder breakers, and two tie breakers may be added later to complete the installation.

With the addition of a third transformer, two feeder breakers and a tie breaker, the duplex scheme can be expanded to serve six feeder positions. A schematic diagram of this arrangement is shown in Fig. 11c. When the Duplex substation principle is expanded to include six or more feeders, the term Multiplex[10] is generally used to describe the arrangement.

A Multiplex substation can contain any even number of feeder positions greater than four. It will be fed by half as many transformers as there are feeder positions. The normally open tie breakers permit the by-passing and removal from service of any circuit breaker or transformer, the same as with the Duplex and Double Duplex arrangements.

The schematic diagrams of the Double Duplex and Multiplex substations, Fig. 11b and 11c, show that there is a similarity between these arrangements and the ring bus. However, on a true ring bus the tie breakers are operated normally closed. The ring bus arrangements is generally restricted to subtransmission and transmission substations. By keeping the tie breakers normally open, the transformers are not operated in parellel, circuit breakers of much lower interrupting capacity can be used, and a different level of voltage can be held by the load ratio control transformers for each pair of feeders.

Bibliography referred to in Part III

7. "Substation One-Line Diagrams," AIEE Working Group on One Line Diagrams of the AIEE Committee on Substations, AIEE Technical Paper 53-237.

8. "Subtransmission Systems As Seen From the Distribution Substation," D. J. Hubert.

9. "A Double Look at the Duplex Substation," R. C. Muir and J. J. Heagerty, Electric Light and Power, April 1954, pp. 101-102.

10. "'Multiplex' Substations for Urban Distribution," Mario Mortara, Electric Light and Power, January 1949, pp. 80-82, 87-89, 93.

Know the law

(*Continued from page 31*)

Very importantly, the opinion of the South Carolina Supreme Court shows that a consumer of electricity is under more strict legal responsibility than is the power company, so far as concerns defective wiring on the consumer's premises.

"The degree of care," says the court, "must be commensurate with the danger involved. Since the electric wires in plaintiff's

home were not owned or controlled by defendant, it was not charged with the duty of inspecting the same to see that they were in safe condition and kept so, and ordinarily could not be held liable for any damage sustained as a result of such defective wiring. . . . If a consumer continues to use the current, knowing that a dangerous condition exists, he assumes the risk consequent upon his conduct. But where a public utility knows that the wiring in a customer's house is dangerous and continues to supply electricity to such home, it incurs liability for the consequences."

Wiring conference

(*Continued from page* 29)

mally come to the minds of businessmen when such rosy pictures are painted were answered factually. It was pointed out, for example, that appliance manufacturers already have the production facilities through which to supply this great market. The utility industry is continuing to expand its present capability of 103 million kilowatts. So they, too, are ready for the tremendous expansion which awaits all of us.

"There was only one big question left. Are we breaking down the barrier of inadequate wiring—the barrier which stands between the electrical industry and its goal of 428 million appliances in the next five years?" — **A. F. Metz, Chairman of the Board, The Okonite Company, and President, National Electrical Manufacturers Association.**

* * *

"Terrific is a mild word to describe the problem facing all of us interested in remedying inadequate wiring. As all of you know, it's been growing by a kind of geometrical progression over the past two decades as more and more electrical appliances are introduced and find acceptance. In fact, it has now reached a size of such formidable proportions that it's a case of our conquering it or it conquering us.

"Enabling customers to pay for a rewiring job in their homes on an installment basis is one approach to a solution; credit on the installment plan having become as traditionally American as baseball or hamburgers. This has the advantage of helping people who don't have any surplus of liquid funds handy to get the work done right away and thus have the benefit of it while they're paying for it." -- **Charles A. Byron, Residential Sales Manager, Connecticut Light & Power Company.**

* * *

"The wiring problem is of interest to building owners, realty management firms, realty appraisers, architects, engineers, electrical contractors, mortgage institutions as well as non-mortgage lending commercial banks, code and other governmental agency authorities, electricians' labor union, electrical equipment manufacturers and distributors and, of course, the apartment resident who will use the electric service. Their principal interest varies and wiring promotion activities must be suited to the basic concern of the individual group.

"It is our opinion that adequate wiring will be installed in apartments as a general practice only if the public demands it. There is not sufficient incentive for builders to provide it, otherwise. Before it will be demanded by the public, we will have to convince them that it is a genuine benefit and worth its added cost, that is, rental. Unfortunately, this is not as easy to sell to the apartment renter as to the private house owner." — **J. O. Covington, Manager, Adequate Wiring Bureau, Consolidated Edison Company of New York, Inc.**

Missouri credit plan

(*Continued from page* 29)

pay any of the first four payments within 30 days after due dates of these payments. This portion of the agreement holds only for the first four payments on the loan.

Utility's protection

The agreement between the lender and the dealer, contractor, or plumber, shall require that the amount of payment assumed by the dealer, contractor, or plumber be deducted from the amount of the unpaid balance of the loan or extension of credit. Under the agreement, Union Electric is not bound to accept any liability for the collection or satisfaction of the loans or extensions of credit made

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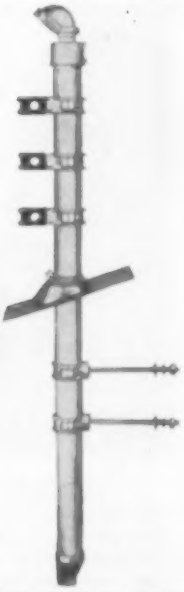

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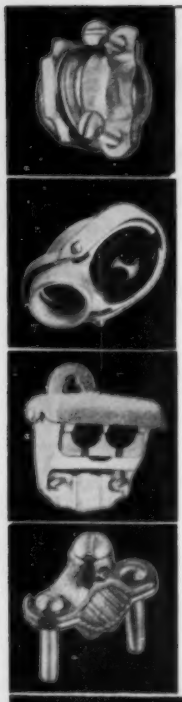
Onorecker-Roberts Co., 2518 Times Blvd., Houston 5, Texas

S. T. Schooler & Co., 2616 N. Davidson St., Charlotte, North Caroline



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by the lender under the Reddy Credit Plan.

The Reddy Credit Plan can be terminated at any time by mutual agreement of Union Electric and the lending agencies participating, or by the giving of written notice of termination by either party to the other at least 30 days prior to the termination date. Termination will not affect any loans or extension of credit made under the plan.

100-ampere services

(*Continued from page* 23)

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Cost of project

Carol City builder Julius Gaines, president of the Gaines Construction Company, said, "We are spending an extra $400,000—$40 per house—to provide this 100-ampere service. From many years of building experience I know that most old homes and too many new ones have outmoded or inadequate two-wire service. This three-wire, 100-ampere service doubles the number of circuits—16 at Carol City—and provides enough electrical capacity for every type of home appliance that can be useful around the home.

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Job-time saving

Carol City's electrical installations have been subcontracted by Gaines to Monahan's Electric Co., of Miami. Subcontractor John Monahan also emphasized that home wiring has not kept pace with the progress of electric appliances and lighting. He explained that a five per cent voltage loss from inadequate wiring, for example, produces a 10 per cent loss of heat in any heating appliance or a 17 per cent loss of light from an incandescent lamp.

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Time payment plans

(*Continued from page* 27)

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The wiring payments are billed on a separate bill from that of the electric service.

Question: *How do you check credit of customers applying for utility-financing?*

Answer: We check the customer's credit very thoroughly. The customer must be owner of, or purchasing the house in or on which the wiring changes are to be made. A short customer credit statement is taken by the electrician or building contractor at the time of application. With the credit statement and help of the local Credit Bureau, it is no problem to obtain the necessary information for approval in a very short time, thus expediting the customer's contract.

Question: *Does the utility discount the note or charge interest on the total amount of the job?*

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Leads on rewiring jobs are not always followed up immediately because many of the larger contractors are very busy with tract work and 3-phase air conditioning installations. Many of the smaller contractors are taking an active interest in rewiring now that the profit margins are so small in new tract work. A factor causing the apparent disinterest in the rewiring market is the great number of problems that exist in the rewiring jobs as compared with new installations.

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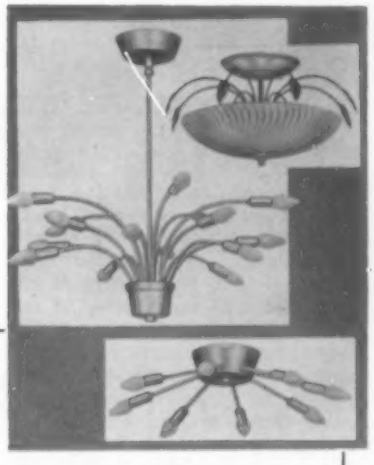

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Transformer manufacturer seeks representation in Southeast. Products include distribution, power, instrument, and specialty transformers of all types from ¼ KVA to 10,000 KVA. Address inquiries to Box 710, ELECTRICAL SOUTH, 806 Peachtree St., N. E., Atlanta, Georgia.

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pose. Our experience thus far proves conclusively that the dealers and contractors cannot effectively promote the wiring finance plan without considerable sales promotion and advertising efforts on the part of the utility. At the time our plan was introduced, because of circumstances existing in the territory we serve, we felt it unwise as a utility to do any broad-scale advertising about the wiring finance plan as such. We had hoped that the dealers and contractors, once they were told of the plan, would use it as a sales tool but this did not materialize to the extent we anticipated.

The program has accomplished much in the way of good customer's relations, has improved contractor sales helps, and has greatly helped dealers selling appliances that require additional wiring.

We do no subsidizing, and are in no position to compare the costs of financing with that of subsidizing.

Question: *As a result of experience, what changes would you recommend in these programs which, in your opinion, would help to make them more effective?*

Answer: Our experience thus far indicates that the rewiring finance program might be made more effective by a quicker follow-up with experienced and aggressive sales men and women on customer's requests for help in wiring problems.

A closer communication between contractors and the over-all electric industry could be of some value, too, since not all the contractors are aware of the efforts being made by the industry in their behalf. These efforts include special newspaper, magazine, television and radio promotions and available mats, reprints and envelope stuffers that are not presently being used to full advantage.

It is very gratifying to us to see the amount of cooperation being extended by the many manufacturers in this important selling job of adequate wiring. We particularly wish to express our gratitude and thanks to the National Adequate Wiring Bureau, Kennecott Copper Company, Anaconda Copper Company, and the publishers of the many trade and consumer magazines for their fine support of our wiring program.

Although utility rewiring finance plans offer a definite solution to a very real bottleneck in major appliance merchandising, I am convinced that dealers and contractors alone cannot promote it to its full effectiveness through their personal sales presentations to the customers. The plan must be properly advertised and promoted directly by the utility.

Production boosted

(*Continued from page* 22)

"Perhaps the fact that the glass mixture actually carries the current may in some way affect the molecular structure," Mr. Robinson stated.

Regardless of the condition causing this phenomenon, Knox has found that the new heating arrangement gives a more pliable raw material, and an over-all better quality of glass.

The firm has also installed such electrical booster systems at their plants at Parker, Pa., and Gas City, Ind., but the Jackson plant is their only Southern plant currently with such an installation. Knox has another Southern plant at Palestine, Texas.

Frank Smith, Mississippi Power & Light's commercial and industrial sales supervisor, and E. G. "Ridge" Thomason, company representative who handled the installation, are quite proud of this addition to regular power load.

Mr. Thomason reports that this installation, which operates at unit power factor, 24 hours a day, is an especially desirable load.

More mileage from drills

(*Continued from page* 21)

of the drill of equal length while sharpening. (Fig. 11) If one edge varies in size the drill will make oversized cuts.

(4) Repeated resharpening of the drill will reduce the clearance between the carbide tip and the steel shank. When necessary, grind away the steel from behind the carbide tip so the steel is nowhere closer than 1/32-inch to the working surface of the carbide blank. (Fig. 12)

Sharpening on the job

Drills can be sharpened on the job by providing a drill stand and a small silicon carbide wheel which can be chucked in the drill.

The different types of spirals used on masonry drills are all designed with one purpose in mind —to remove the cuttings as quickly as possible.

Each manufacturer has his own process for welding the cutters to the bit and as these methods vary, there is some variation in the amount of heat required to loosen the cutters. It's best not to take a chance but keep the bit cutting while in the hole and allow it to cool frequently. Sharp bits operate more coolly.

Under proper use 12 to 15 feet of hole can be obtained before sharpening is required.

More about steel embedded in concrete—all single point drills will veer off to one side and break if embedded steel is encountered.

Only a rotary type core drill on which some 6 cutters are used should be used to cut through embedded steel. These drills will be held in position on top of the steel by the previously drilled hole and will be able to cut through. It will be more difficult to drill when the steel is on one side rather than in the bottom but this can be handled, too, if the drill is sharp.

Index of ADVERTISERS

A

Abolite Lighting Division Jones Metals Product Co. *
Accurate Mfg. Co. *
Adam Electric Co., Frank *
Advance Transformer Co. *
Air Conditioning Products Co. 78
All-Steel Equipment, Inc. *
Allis-Chalmers Mfg. Co. 16
Aluminum Co. of America *
Amelia, J. Donald *
American Metal Molding Co. *
American Steel & Wire Div., U. S. Steel Co. *
American Telephone & Telegraph Co. 53
Anderson Brass Works, Inc. *
Anderson Co., Bob 89
Anderson Co., Geo. E. 48, 81
Arro Expansion Bolt Co. 64
Arrow-Hart & Hegeman Elec. Co. *
Art Metal Company 6
Atlanta Conduit Fittings Co. 92
Atlantic Steel Co. *

B

B & C Metal Stamping Co. 68
Bagby Co., S. L. *
Bagur, Pierre E. 89
Bailey, Jr., J. H. 17, 90
Bevan, W. H. 15
Benjamin Electric Mfg. Co. *
Benjamin Electric Mfg. Co., Leader Div. *
Bennett Assos., Leon 87
Berko Elec. Mfg. Co. *
Berns Manufacturing Co. 85
Berry Co., W. H. *
Biglin Co., Inc., H. C. 78
Bissell, T. L. 66, 67
Blackhawk Industries 91
Briegel Method Tool Co. 73
Broan Manufacturing Co. 70
Brock, Wm. *
Brown, Clark E. *
Bryant Electric Co. *
Buffalo Forge Co. 82
Bulldog Elec. Products Co. 77
Bullivant, F. J. 93
Burbank Electric Products 90
Burndy Engineering Co. 69
Burrus & Matthews 68
Bussmann Mfg. Co. Back Cover

C

Calverly, W. R. 69
Capy, Phil L. 15
Carol Cable Co., Div. of the Crescent Co., Inc. 9
Cason, William Second Cover
Cavalier Corp. *
Certified Equipment Mfgrs. (Ballasts) 80
Champion Lamp Works *
Chapman & Co., Gary 12, 86
Chelsea Fan & Blower Co. *
Circle F. Mfg. Co. *
Clarke, B. L. 87
Classified Ads 94
Cole, J. H. 93
Columbia Cable & Electric Corp. *
Comer Sales *
Conrad, C. H. *
Cope, Inc., T. J. *
Copy, I. E., & Co. *
Cornish Wire Co. *
Craig-Owen Co. 2, 95
Crenshaw, Wm. *
Cressy Sales Co. *
Crockett-Lund Co. *
Crouse-Hinds Co. 4
Curtis Lighting *

D

Davis, Frank B. *
Dawes, Edgar E. *
Day-Brite Lighting, Inc. *
Distribution Assemblies Department, General Electric Company *
Dossert Mfg. Co. *
Douty and Downie 85
Doxsee, Leigh A. 86
Drake, Arch 6
Drane, Becker *
Duncan Electric Mfg. Co. *
Dunlop & Dunlop *

E

Eastern Fixtures Co. *
Electrend Products Corp. 96
Elder & Co., John W. 82
Electro Compound Company *
Electromode Corp. 95
Elgo Shutter & Mfg. Co. *
Engineer Sales Co. 66, 67
Epperson, W. E. 42
Estimating Handbooks Associates *
Everett Co., John T. 85

F

Fagen, Carl F. *
Fain, Buster 87
Fanner Mfg. Co. 76
Fasco Industries, Inc. 57
Federal Pacific Electric Co., Inc. *
Felter Co., John 78
Fender, H. J. *
Ferguson, Lynn W. Second Cover
Fielder Co., Tom 90
Finney, Collin 17
Fishburne, R. W. 68
Fleming & Co. 86
Forester Equip. Co. *
Fullman Mfg. Co. 86
Furnas Electric Co. 74
Fussell, O. N. *

G

G & W Elec. Specialty Co. *
Gaines & Co., John G. *
Galvin Sales *
Gearhart, Walter V., Co. *
Gedney Electric Co. *
General Electric Co. Distribution Assemblies Dept. *
General Electric Co., Conduit Standard & Construction Materials Div. *
General Electric Co. (Lamp Div.) *
General Electric Co., Trumbull Components Department *
General Electric Co., Wire & Cable—Construction Materials Div. *
General Electric Co., Wire & Cable—Contractor Market *
General Electric Co., Wiring Devices—Construction Materials Div. *
General Electric Co., Distribution Transformers Department *
Gerstenberg, E. A. *
Gibson Manufacturing Company *
Glenn & Larson 17, 69
Gover, Hiendly R. 55
Graybar Electric Co. *
Green, George Second Cover
Gregory-Salisbury Co. *
Gulf Sales Agency 50, 51
Guth Company, Edwin F. *

H

Hagan, E. J. *
Hagan, Jack 68, 90
Hammon, C. V. 2
Hancock Co., John 90
Harris-Hanson Co. *
Harrison Co., Tom *
Helwig Company 93
Hill, Ken 17
Hindle Transformer Co. 93
Hinson, Walter M. 68
Hogan, Jr., Paul Second Cover
Holmyard, Hal 88
Hopper & McCoy 64, 92
Hubbard & Co. 65
Hubbell, Inc., Harvey 62
Huemmer, Walter J. 17, 32, 50, 51, 89
Hunter Fan & Ventilating Co. Front Cover
Hyden, Elmer 2

I

Ideal Industries, Inc. *
Irvin, John 2
I.T.E. Circuit Breaker Company *

J

Jay Lighting Mfg. Co., Inc. 93
Jones, Arthur S. *
Jones Metal Products *
Judge, Fred *
Junghans, Herman J. *

K

Kaiser Aluminum & Chemical Corp. *
Kearney, James R., Corp. 37
Keener, Frank E. *
Keller, W. J. *
Kennon, W. N. 43
Kerrigan Iron Works, Inc. 87
Keystone Mfg. Co. *

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For BIG Rooms

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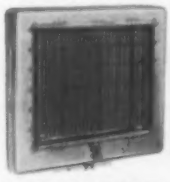
Distributes Heat by Down-Flo Principle. Silver Grey Hammertone Finish

For BATHROOMS

MODEL WJA

Choice of Chrome or White Enamel Finish



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Index of ADVERTISERS

Killark Elec. Co. 81
Koeln & Co., Geo. R. 82
Krachy Co., A. C. ..... *
Krueger & Hudepohl 92
Kuhlman Electric Co. ..... *

L

Lamb & Co., A. V. 95
Landers Co., L. Morris 50, 51, 90
Lassiter, W. H., Jr. 82
Ledford, L. O. ..... *
Leviton Mfg. Co. 79
Light & Power Utilities Corp. 2
Lint Co., Clyde W. ..... *
Lloyd, Chester R. ..... *
Lloyd Factory Sales Agents, J. A. 9, 87
Lombardi, E. F. ..... *
Loyd, Inc., Ernest T. 81
Luesing, Wm. 85
Lumpkin, Paul 85

M

Macon, H. L. ..... *
Massey, Inc., A. H. 89
Mayerson-Follman Co. 85
M & W Electric Mfg. Co., Inc. ..... *
Marcus Transformer Company, Inc. ..... *
McCain, J. E. 93
McCoin, B. H. ..... *
McCourt, Leo. T. 81
McCreary, B. L. 82
McNeill, B. E. 93
McPherson, F. C. 90
Meier Electric & Machine Co., Inc. ..... *
Michler, P. A. ..... *
Miller Company, The ..... *
Milner, Gene W. 11
Milner & Co., W. J. 2, 11, 32, 57
Mims & Assoc., Clyde E. ..... *
Mitchell Manufacturing Co. 43
Moos, Frank ..... *
Morris, Lynn H. ..... *
Munding Elec. Sales Agency 88
Musgrove, Curtis 66, 67
Myrick, C. C., Jr. ..... *

N

Nash, Walter 73
National Electric Products Corp. 7
Nelson, W. F. 89
Neo-Ray Products, Inc. 89
Nichols, N. B. 2
Norris Thermador Corp. ..... *
North, J. Scoby 64
Noser, J. A. 90
Novelty Lighting Corp. ..... *
Nutone, Inc. ..... *

O

O Z Electrical Mfg. Co., Inc. ..... *
Ong, Richard 85
Orangeburg Mfg. Co., Inc. 33
Orlick, A. M. 79
Osmose Wood and Preserving Co. of America, Inc. 94

P

Paranite Wire & Cable Div., Essex Wire Corp. 41
Pass & Seymour, Inc. 85
Peabody Brothers 47, 55
Pendergraph Co., H. A. 85
Penn-Union Elctric Corp. 50, 51
Perfeclite Company 32
Peterson & Lowe 64
Phelps Dodge Copper Products Corp. 45
Picker, F. C. ..... *
Pittsburgh Standard Conduit Co. 59
Plymouth Rubber Company, Inc. ..... *
Porcelain Products, Inc. ..... *
Prag, Elmer ..... *
Prescolite Mfg. Co. 90
Preway, Inc. 87
Progress Manufacturing Co. 13
Pryne & Company, Inc. ..... *
Pyle-National Co., The 82
Pyramid Instrument Corp. ..... *

R

Ramond, Chas. K. 2
Randall, Jim 85
Redmann, S. M. 82
Revere Electric Mfg. Co. ..... *
Richey, E. B. ..... Second Cover
Ridge Tool Company ..... *
Ridgeway, J. T. 68
Rivera, M. ..... *
Roberts Manufacturing Co. ..... *
Roberts Co., Bob ..... *
Robertson, Elgin B. 69
Robinson, C. E. ..... Second Cover
Rome Cable Corp. 55
Rose Equip. Co., W. L. 69
Rose, Herb M. 43
Rosebrough, Lee B. 88
Rottman, O. H. ..... *
Royal Electric Company 12

S

Sangamo Electric Company ..... *
Schisler, D. A. ..... Second Cover
Schoolar, S. T. 32
Sessoms, Perry 95
Shaw-Hardy Co. 69
Sheehan & Assoc., J. D. ..... *
Simmer, F. H. 86
Simplex Wire & Cable Co. 15
Simpson & Sons, P. M. ..... *
Smithcraft Lighting Division 17
Snoots, Wayne ..... *
Sommerlath, Jr. & Assoc., E. G. 95
Sorgel Electric Co. 61
Southern Agencies ..... *
Southern Electric Corp. 66, 67
Southland Sales Agents ..... *
Southwire Company 1
Spang-Chalfant Div., National Supply Co. ..... *
Sperti Faraday, Inc. 88
Square D Co. ..... Third Cover
Sta-Brite Fluorescent Mfg. Co. 94
Steel City Electric Company ..... *
Stephens, V. E. 89
Stockdale Co., S. C. ..... *
Stone, Carson 93
Storer & Assoc., Sheldon ..... *
Strong, Carl 68
Sullivan, Jr., W. E. ..... *
Sunbeam Lighting Co. 11
Swan Sales Co. 89
Sylvania Electric Products, Inc. ..... *

T

Tennessee Coal & Iron Div., U. S. Steel Company ..... *
Thermoray Corporation ..... *
Thomas & Betts Co. 49
Thompson Co., Walter E. 69
Thornton, E. B. 17, 89
Thorsell, Carl W. 90
Tindall, Norman E. ..... Second Cover
Titherington, R. G. 32
Tomic Sales & Engineering Co. ..... *
Trade-Winds Motorfans, Inc. ..... *
Traweek-Healy & Assoc. 2
Triangle Conduit & Cable Co. 63
Trowbridge, N. W. 2
Trumbull Components Department, General Electric Co. ..... *
Turner, Will 13

U

Union Insulating Company ..... *
United States Rubber Co. (Wire & Cable Div.) ..... *
United States Steel Co., American Steel & Wire Div. ..... *
United States Steel Export Company ..... *
United States Steel, Tennessee Coal & Iron Div. ..... *
USCO Power Equip. Co. ..... *
Utility Products Co. ..... *

V

Victor Insulators, Inc. ..... *

W

Wadsworth Electric Mfg. Co., Inc. ..... *
Wakefield Brass Co., The F. W. ..... Second Cover
Walsh & Co., J. J. ..... *
Walter, F. F. ..... Second Cover
Want Ads 94
Ward Co., Chas. L. 69
Ward Engineering ..... *
Ward, L. R. ..... *
Warner, Stephen ..... *
Watts, Sam J. ..... *
Weingarten & Sons, B. 85
Western Insulated Wire ..... *
Westinghouse Electric Corp. 39
Weyhing, Louis J. 2
Whitman, Marshall L., Co. ..... Second Cover, 47
Wheeler Reflector Co. 47
White, C. O. 93
Wildeman, Walter W. 87
Winkler, B. L. ..... *
Wiremold Company, The ..... *
Wood & Anderson ..... *
Wood, Donald D. 6
Woodyard, Charles L. 90

Y

Youngstown Sheet & Tube 71

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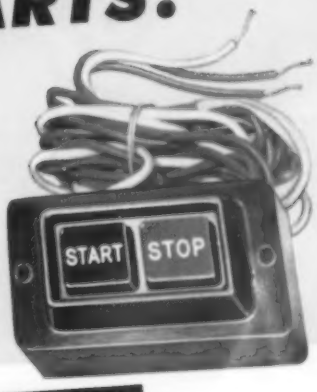

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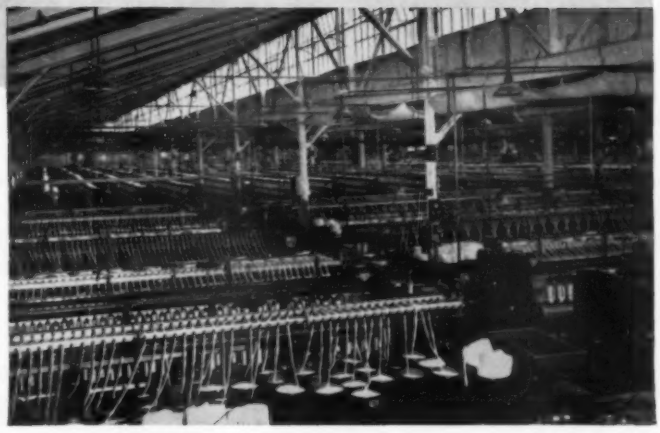
"We started using Fusetron Fuses in the winter of 1949 and began to keep individual records on motors. The reduction on motor burnouts was immediately noticeable.

"There is no way of knowing, but it is my belief that some motor repairs now are due to partial damage done prior to 1949.

"In the entire plant we have over 2,500 motors, representing a little more than 5,000 hp connected load. The following list shows our actual expenses on motor repairs."

Year of Repairs	Number of Motors	Amount
1949	(No record kept)	$6,804.00
1950	87	2,796.20
1951	59	2,640.44
1952	63	2,165.63
1953 (1st 6 mos.)	23	445.84



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2. Protect against needless blows caused by harmless overloads.
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4. Provide thermal protection — for panels and switches against damage from heating due to poor contact.
5. Protect motors against burnout from overloading.
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8. Make protection of small motors simple and inexpensive.
9. Protect against waste of space and money — permit use of proper size switches and panels.
10. Protect coils, transformers and solenoids against burnout.

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